

The REFRIGERATION & AIRCONDITIONING Business

AUGUST 1961



What's
Best For
Commercial
Buildings?

*thru-the-wall
room units?*

*remote fan-
coil systems?*

HOW
TO GET A
GOOD
INSULATION
JOB FOR
YOUR
CUSTOMER

PROJECT **Upgrade:**

Is price
cutting
a problem
with you?

The magazine for the Installing Contractor-Dealer of airconditioning
and commercial and industrial refrigeration



PEOPLE PUT THE PLUS IN VIKING TUBING

Viking's position as one of the nation's leading suppliers of thin-wall copper tubing has been achieved through the skill and dependability of the *people* at Viking.

Since Viking specializes in the manufacture of copper tubing for the refrigeration and air conditioning industry, Viking people are experts in the field. They know the importance of rigid adherence to the highest standards of temper, tolerance and uniformity to meet the customer's most exacting needs and specifications. They gear themselves to the needs of customers . . . adjusting and revising production and delivery schedules to conform to standard or emergency demands.

As a result, Viking quality and Viking service add up to a valuable *plus* for manufacturers of air conditioning and refrigeration units and coils.

The *people* at Viking will gladly discuss your copper tube requirements with you . . . you'll find the *plus* pays dividends.



VIKING
COPPER TUBE CO.
CLEVELAND 10, OHIO
PRECISION DRAWN SEAMLESS COPPER TUBE

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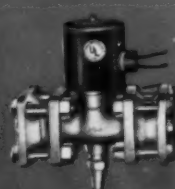
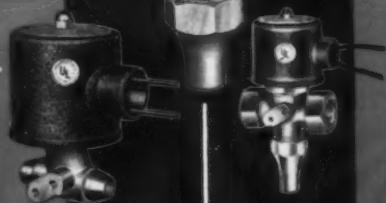


SPECIFY • INSTALL

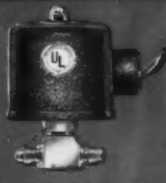
ALCO SOLENOID VALVES

—for trouble-free performance . . .
for every refrigerant control application

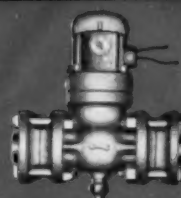
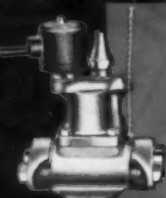
**LIQUID • SUCTION • HOT GAS
BRINE • WATER • STEAM • AIR**



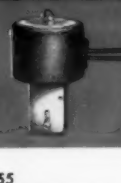
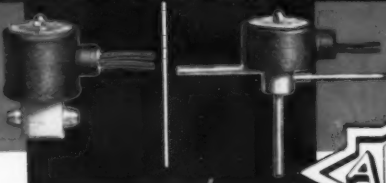
Compact • Constructed for hermetic and non-hermetic applications • Come apart quickly for cleaning and servicing • Manufactured of the



best grades of corrosion-resistant materials • Cool, high-powered coil — moisture-proof impregnated — manufactured by Alco to Alco's



high precision standards. Positive closing with pressure-tested seating for positive shut-off • Wide variety of types, sizes, connections.



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Write for Specifications Bulletin No. 173-55

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- BUY QUALITY
- BUY ALCO

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Refrigerant Filter-Driers • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

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In The Lead With Ucon® Refrigerants



"Fustest with the mostest" is UCON IKE's history thus far, as witness the pioneering of the ring-top refrigerant cylinder, introduction of the handwheel cylinder valve, and instant cylinder deposit refunds . . . all important firsts in packaging and convenience.

And being in the lead is something UCON IKE and the friendly folks he represents, firmly intend to *continue*. When you *really* need something, *we'll deliver* — whether it be in packaging conveniences or helpful service.

Our promise: being on our toes to meet *your* every on-the-job refrigerant need.

For the most compact and *convenient* line of refrigerants . . . See your UCON Refrigerants wholesaler.

UCON Refrigerants are manufactured by
UNION CARBIDE CHEMICALS COMPANY — Division of Union Carbide Corporation
270 Park Avenue, New York 17, N. Y.

Exclusive Sales Agent to Air Conditioning and Refrigeration Wholesalers
ANSUL CHEMICAL COMPANY, Marinette, Wisconsin

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- 37 **Let's Talk Business: editorial of the month**
Upgrade Price cutting and profits don't mix. The installing contractor-dealer can't cut prices and get a fair return on his investment.
- 38 **Is price cutting a problem in your business?**
Upgrade A manufacturer and a contractor admit that it is in theirs, and they spell out what can be done about it
- 40 **Charge what the job is worth**
Upgrade That's the answer to price cutting, says business management consultant George Webster
- 41 **How to lick cut-price competition**
Upgrade Here's a constructive 3-step program you can put to work in your own business right now
- 42 **Do you cut service prices?**
Upgrade This detailed cost analysis by Southern California contractors will help you price your work at a profit
- 43 **Looking for ways to fix profits?**
Upgrade That's not the answer to the price-cost squeeze affecting wholesalers, George Webster tells ARW's Region 5
- 44 **Fan-coil systems vs. thru-the-wall room units**
What's best for commercial buildings? Two experienced specialists offer their pointed opinions.
- 48 **How to get a good insulation job for your customer**
Close cooperation between refrigeration and insulation contractors pays off in jobs that perform properly
- 50 **TV station uses half mile of prefab duct**
... and the contractor installed it all with just a knife and a screwdriver
- 53 **Applications Manual by Hugo C. Smith**
Three ways to handle air-cooled condenser installations in supermarkets
- 65 **Service Clinic for Contractors**
 - Good housekeeping will help keep your customers' cooling equipment running efficiently
 - How an Illinois contractor seals seams in airconditioning ducts with a caulking gun

DEPARTMENTS

- | | |
|----------------------|---------------------------------|
| 6 Business Briefs | 34 Recent Installations |
| 16 Business Trends | 43 Wholesaler Activities |
| 21 Useful Literature | 57 People on the Move |
| 28 Product Data | 58 Contractor-Dealer Activities |



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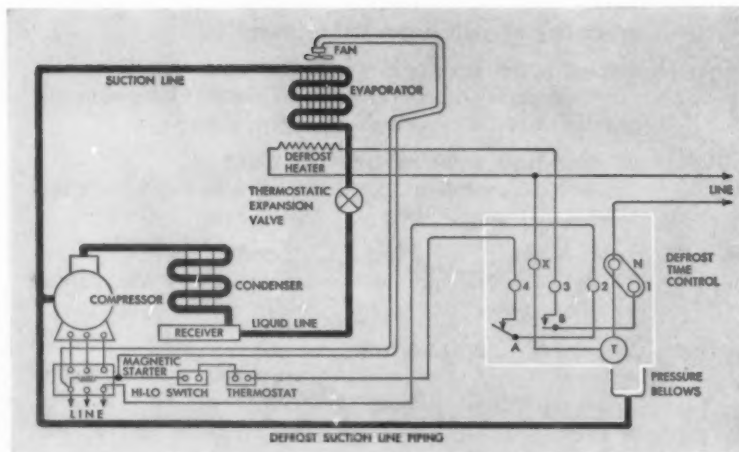
EXCLUSIVE: Length of defrost cycle determined by pressure increase . . . not by time.

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EXCLUSIVE: Adjustable pressure cut-in.

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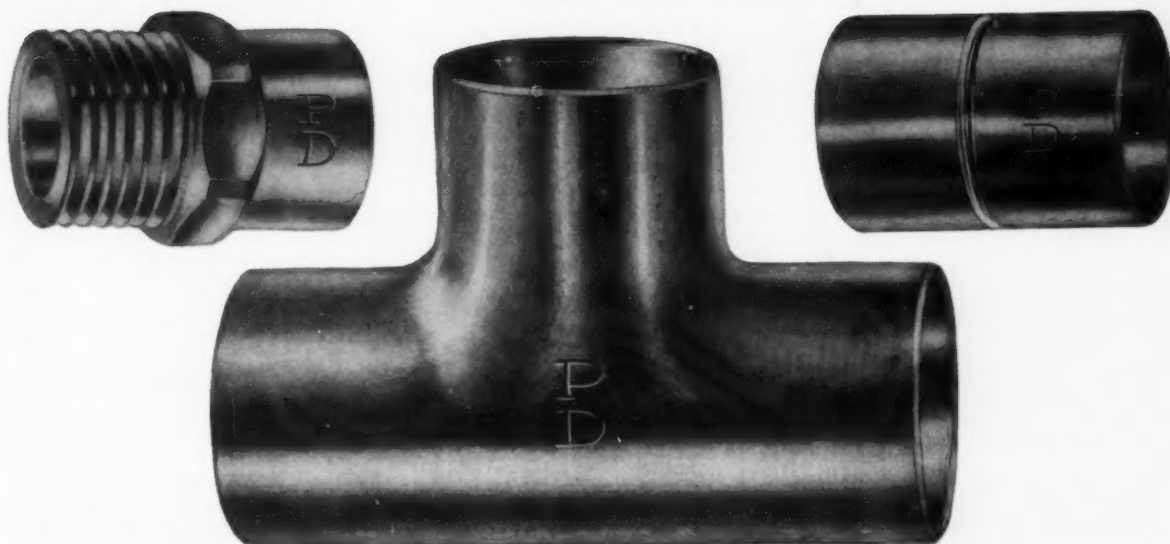
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New addition to the famous Mine-to-Market Quality Line

PHELPS DODGE WROT FITTINGS for Air Conditioning and Refrigeration Tube



Phelps Dodge has expanded its line of products for the air conditioning and refrigeration industry to include a wide selection of wrot solder-type fittings. In keeping with modern specifications, both fittings and tube can now be obtained from Phelps Dodge—a single dependable source of supply.

PD wrot fittings are available in sizes ranging from $\frac{1}{8}$ -inch to six inches. All fittings are protectively packaged to assure factory-clean condition.

Initial warehouse stocks have been distributed to five key centers, Boston, Chicago, Los Angeles, Houston and Tampa, Fla., for fast, convenient service. Order through your Phelps Dodge wholesaler.

A copy of the new PD fittings catalogue is ready for you. Use the coupon below.

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Please send me your new fittings catalogue.

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BUSINESS *Briefs*

ARI certification program to include unitary heat pumps to 135,000 Btuh

Unitary heat pumps soon will be included under the Air-Conditioning and Refrigeration Institute Certification Program, according to John A. Gilbreath, ARI's unitary airconditioner section chairman.

Action is pending installation of test equipment and completion of contracts and other preliminary details.

The program will include unitary heat pumps up to 135,000 Btuh cooling capacity, but not reverse-cycle room airconditioners. It will follow closely the contractual relationships, procedures, and testing of equipment of the unitary airconditioner certification program. But, because the equipment is more complicated, a number of modifications have had to be made in testing requirements.

The new program will be administered by ARI under direction of the unitary airconditioner section.

A revised ARI Standard for Unitary Heat Pump Equipment (ARI-240-61) has been published. The last previous revision, published in 1957, has been completely rewritten to provide a basis for the proposed certification program.

Two features of the new standard are revised rating conditions

which call for standard rating capacities for both summer (at 95 F outdoor temperature) and winter (at 45 F indoor temperature) operation. There's an additional required winter condition rating at 20 F outside temperature to cover operation at lower outside temperatures than previously.

Testing heat pumps requires a longer time and additional equipment, since pumps must be made to operate under a wide range of conditions. This requires extra time and manpower, as well as equipment.

Packless changes cities

Packless Metal Hose, Inc. has moved its offices and plant from Mt. Vernon, N.Y., to York, Pa., on property adjacent to the U.S. Expansion Bolt plant and offices.

Besides providing space to expand its product line, Packless can now use U.S.E. engineers and technical personnel.

Kenneth B. Zifferer, president of Packless, also heads U.S.E.

York changes location of production facilities

Production of York room airconditioners will move from Decatur, Ill., to the Norge Div. plant, Fort Smith, Ark. Increased space and new equipment at Decatur will allow for more production of automotive airconditioner compressors and for the development of new products.

New processing and tooling at Fort Smith will be used for further research in room airconditioners, Joseph Elliott, president of York Div., Borg-Warner Corp., said.

Marion L. Dannells, Jr., has been appointed plant manager of York's Decatur operation.

CALENDAR OF EVENTS

October 8-11, 1961

National Commercial Refrigerator Sales Association (Annual Convention)

The Riviera Hotel
Las Vegas, Nev.

November 6-10, 1961

National Warm Air Heating and Air Conditioning Association (Annual Convention)

La Salle Hotel
Chicago, Ill.

November 16, 1961

National Electrical Manufacturers Association (Annual Meeting)

Summit Hotel
New York City

* * *

February 12-15, 1962

12th Exposition of Air-Conditioning, Heating, and Refrigeration Industry

Great Western Exhibit Center
Los Angeles, Calif.

Stewart-Warner receives order to cool AF base

An order for 430 central airconditioners and 430 sectional gas furnaces has been received by Stewart-Warner Corp. for installation at Turner Air Force Base, Albany, Ga.

Included in the order are 216 3-hp airconditioning units; 211 4-hp units; and 3 5-hp units.

Fleet named sales manager of new Vering division

E. Van Fleet has been appointed national sales manager for newly-organized DeVille Div., Vering, Inc., manufacturers of reach-in and walk-in coolers.

Regional managers for the new line are: Royal Lee and Ernest Nordgarden, Portland, Ore.; Lloyd Honn, Honolulu, Hawaii; Roy Gall, Los Angeles, Calif.; James Lessard, San Francisco, Calif.; and Floyd Oberle, Salt Lake City, Utah.

Continued on page 89

Crane opens first of 3 international showrooms

An international showroom, featuring Crane Co.'s industrial and domestic products, opened recently in New York City.

Unlike usual showroom displays, products are arranged in a Japanese garden theme to emphasize design and performance.

Similar Crane showrooms will open in Chicago and Los Angeles later this year.

Crystal Tips®

ICE MAKERS

Every model is a MONEY-MAKER FOR YOU!

THE ONLY COMPLETE LINE OF 2-IN-1 ICE MAKERS!

It's an ice cube maker—it's an ice chip maker—it's 2-in-1!



B-11



B-200



B-300



B-500

World's Newest, Finest Flakers



A-34



A-14



Here's why there never was a better time than *right now* to make the move to Crystal Tips ice makers. Crystal Tips now offers the widest, best line of ice makers in its history. These Crystal Tips ice makers give you the most *advanced design* of any equipment made. Advanced design means you are years ahead in engineering features and styling. Crystal Tips also give you more honest sales features such as: *three* distinct types of ice to meet the needs of every ice user. Crystal Tips also mean lower inventories because *fewer* models satisfy *more* markets. Crystal Tips higher distributor profits mean *more money in the bank* for you. In addition to the finest products, Crystal Tips backs up distributors with one of the largest, hard-hitting advertising and sales-making promotions in the entire ice machine industry.

We want aggressive distributors now. If you're now handling several lines of ice makers, consolidate and concentrate your activity on Crystal Tips. You'll be money ahead. You'll find sales are easier; service much simpler; profits greater. Or, if you are not now handling a line of ice makers, contact us today. We've got news that means more sales and bigger profits for you.

"Crystal Tips" is the registered trade-mark of American Automatic Ice Machine Co.

AMERICAN

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A Division of McQuay, Inc.



PENN WATER VALVE OUTSELLS ALL OTHERS



ONE BIG REASON is that the Penn "246" stays on the job longer than ordinary valves. In the Penn water valve, two diaphragms keep water away from the bellows, range spring and sliding parts. Thus, water with its rust, corrosion and sedimentation never has a chance to attack these "working parts" and cause destruction. Ask your wholesaler... he'll tell you the Series 246 is the best.

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N. Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

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★ ★

REFWARD

**FOR ANY INSTALLED NIBCO VALVE
OR FITTING PROVED DEFECTIVE!**



Pictured is hydrostatic testing of individual cast fittings. This combined with NIBCO's statistical quality control insures freedom from porosity, sand holes and other defects. These are two of the methods used to establish NIBCO's fine line of quality in the finished product.

The experienced contractor appreciates the dependability of a good solder joint. He also knows that *a solder joint is only as good as the fitting used*. Fittings must have proper tolerances*, absolute uniformity of quality. *Both are now guaranteed* by NIBCO. Any fitting or valve found defective upon installation will be replaced with a new one—wrapped in a crisp \$5.00 bill! (Payment is subject, of course, to examination and confirmation by NIBCO.) So insist upon NIBCO, valves and fittings with the "\$5.00 REWARD" guarantee!



*** A simple tester gauges fitting-to-tube tolerance that permits full, complete solder penetration. Free upon request.**

NIBCO, INC., Dept. L-6908, Elkhart, Indiana

NIBCO



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"Robbi" *NOW* offers the



All four models are two-stage, Duo-Seal rotary units equipped with vented exhaust (gas ballast), power cord with in-line switch and are charged with oil ready for operation.

VENTED EXHAUST

(GAS BALLAST)

The Vented Exhaust lets moisture pass through the vacuum pump instead of condensing into the oil. This means you can pull a higher vacuum faster, and do so repeatedly without the bothersome trapping and excessive number of oil changes required for units without this feature.

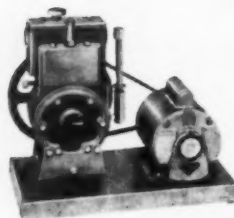
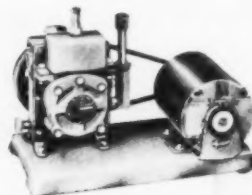
Contact your local "Robbi" wholesaler or write direct for additional information.

WELCH DUO-SEAL® PUMPS

to the Refrigeration Industry

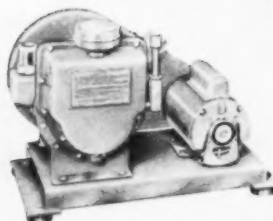
Recognized by the industry as top quality High Vacuum Pumps for evacuating and dehydrating refrigerant systems.

No. 13000-75
Vacuum—.1 Micron*
Capacity—.75 C.F.M.



No. 13000-2
Vacuum—.1 Micron*
Capacity—2 C.F.M.

No. 13000-5
Vacuum—.1 Micron*
Capacity—5 C.F.M.



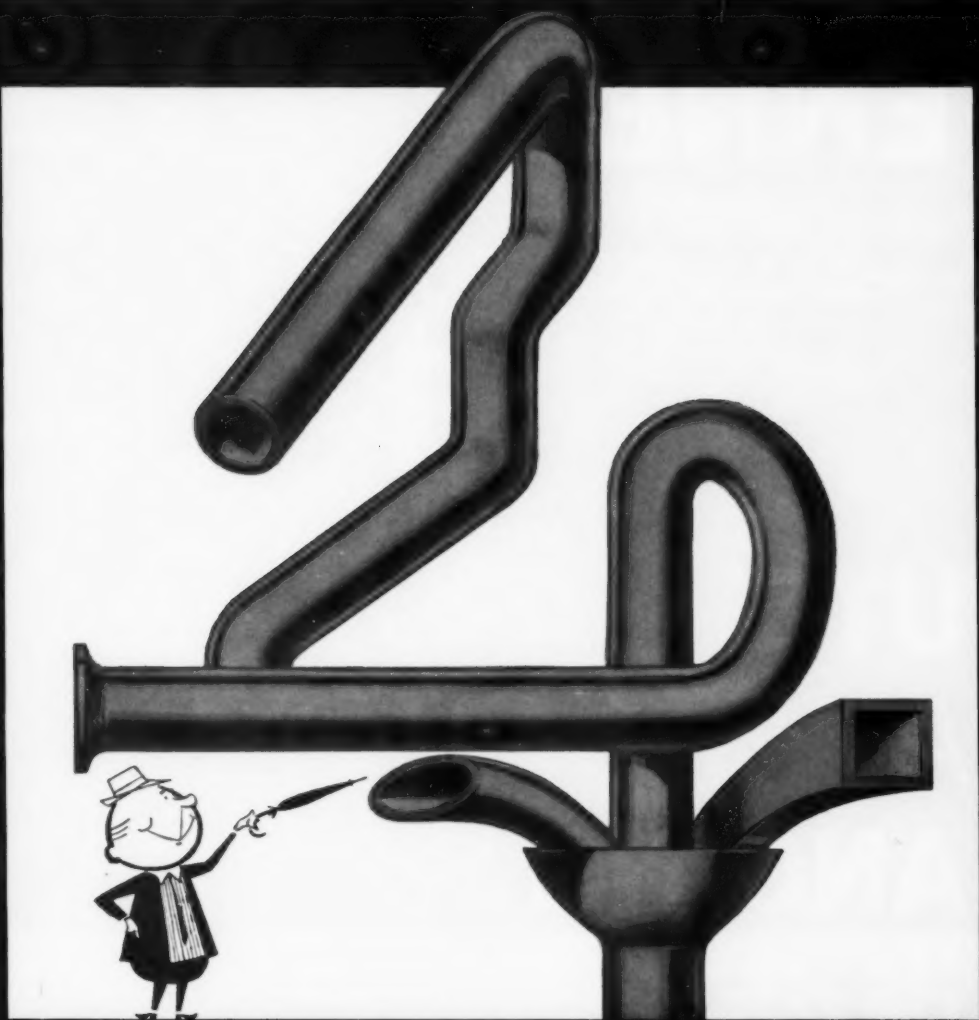
No. 13000-15
Vacuum—.1 Micron*
Capacity—15 C.F.M.

* Vent closed—McCloud Type Gauge

ROBINAIR®

MANUFACTURING CORP.
MONTPELIER, OHIO

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Do your products require fabricated or finish formed parts or special tubular shapes? Our specialized skills, backed by 40 years of experience, offer you the opportunity to improve product quality . . . lower unit cost!

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costs you nothing . . . yet may save you a great deal.

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TENNEY

PUTS PAN HANGING

on the RIGHT TRACK!



Refrigeration, Heating
& Air Conditioning
Products Division

Tenney
ENGINEERING, INC.

1090 SPRINGFIELD ROAD • UNION, NEW JERSEY

Trust Tenney's forward-thinking engineers to dream up this time-saving idea for coil and pan installation: a built-in track running horizontally along the side of the coil **plus** perforated, vertical hangers attached to the pan. Thus, you can quickly adjust the distance **between** pan and coil, as well as the pan's position from **left to right** — and lock the installation into place with the turn of a thumb screw!

Tenney coils also provide for end mounted thermostatic expansion valve and a facetized aluminum fin for increased surface, stronger fins and better heat transfer.

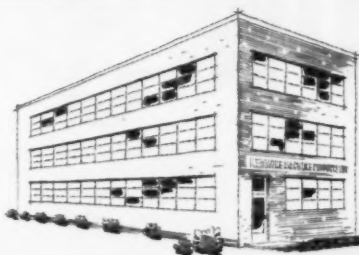
Pans may be arranged either right hand, left hand or paired, right in the field. All are made of plastic coated aluminum that is virtually indestructible and easy to clean.

For complete details on all Tenney pans, coils and combinations, write today!

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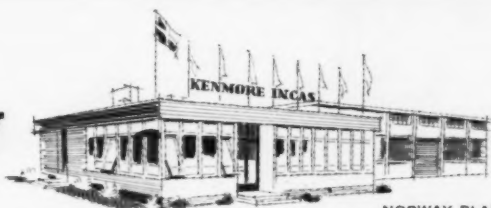
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IT'S WISE



PLANT 2—
LYONS

TO FOLLOW



NORWAY PLANT

THE LEADER!



MAIN PLANT—LYONS

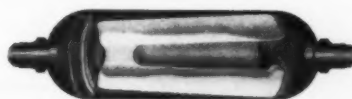
KMP WORLD'S LARGEST
EXCLUSIVE MANUFACTURER OF
REFRIGERATION DRIERS



CANADA PLANT

For the past quarter of a century our business has been devoted exclusively to the manufacture of refrigeration and air conditioning driers, accumulator driers, accumulators, strainers and capillary assemblies. It is not a sideline. Consequently all of our research and engineering efforts have been directed to the development and manufacture of better,

more efficient products. One result is the KMP FILTER-KORE drier, the first 100% solid core molecular sieve drier made to do a better job for the manufacturer and serviceman. We believe this specialization is why over 187 of the world's leading refrigeration and air conditioning manufacturers buy KMP products.



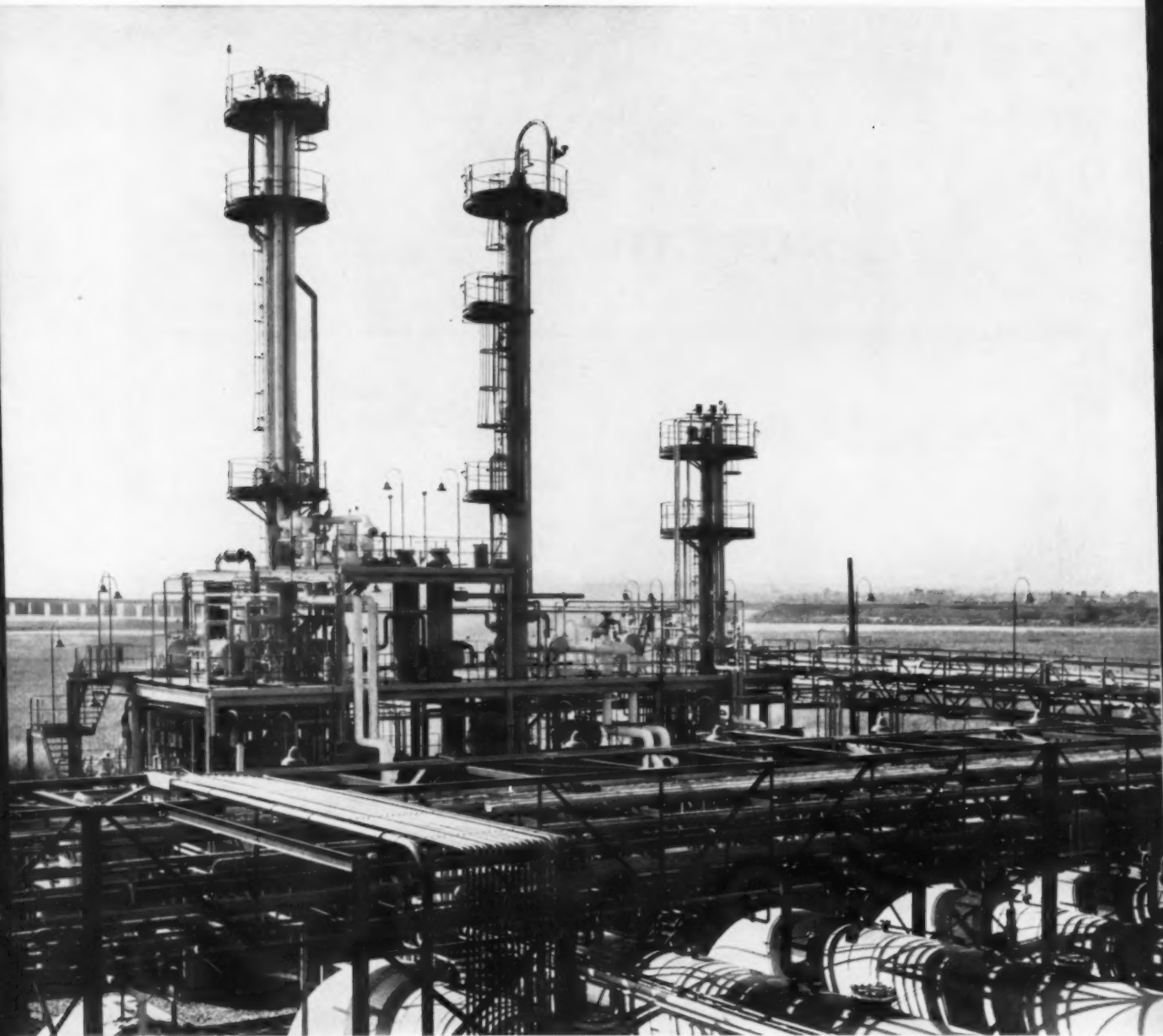
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NOW 3 "GENETRON"[®]



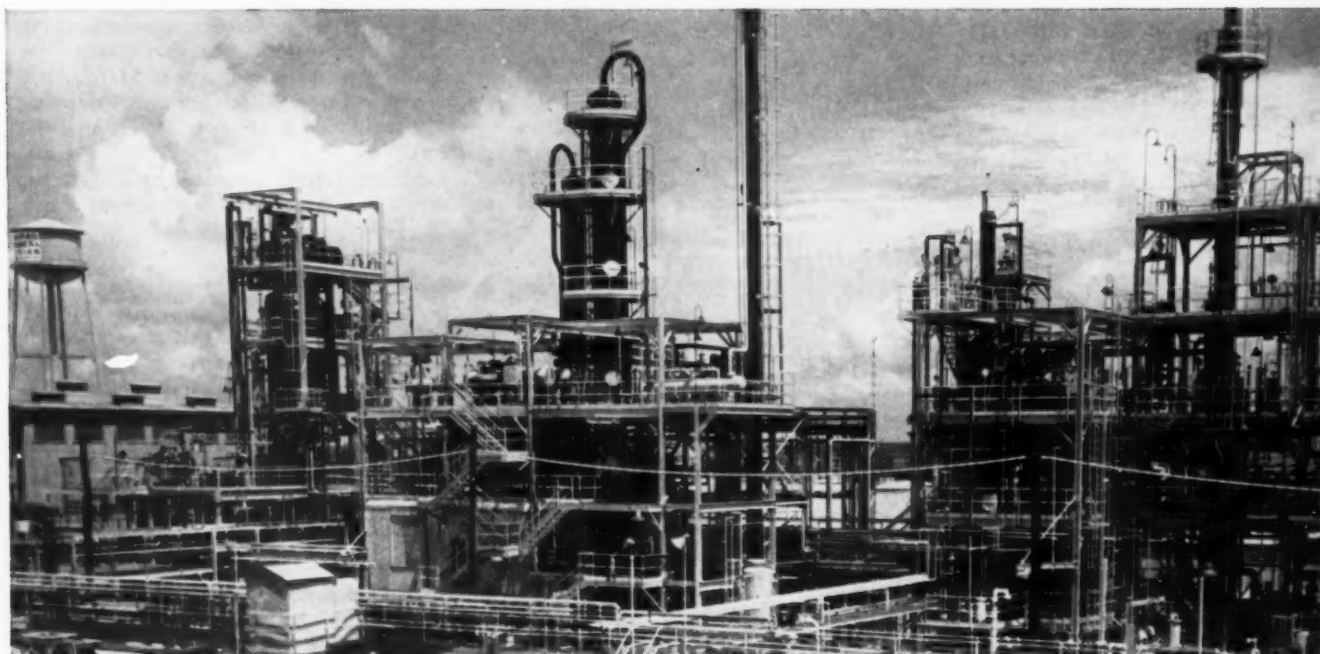
Above: General Chemical's brand-new "Genetron" plant in Elizabeth, New Jersey has a capacity of more than 10,000 tons of "Genetron" per year. Its output will serve consumers throughout the Northeast. This large new plant is the third "Genetron" facility serving industry. It supplements production at Danville, Illinois, and Baton Rouge, Louisiana. These three highly efficient, big-capacity plants are three good reasons why General Chemical is your *dependable* source for highest quality fluorocarbon refrigerants and aerosol propellants. Be sure—always specify "Genetron."

PLANTS TO SERVE YOU

◀ New "Genetron" plant at Elizabeth, N.J. now on stream



Other "Genetron" production centers at Danville, Illinois...



...and at Baton Rouge, Louisiana



GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N. Y.

BUSINESS *Trends*

HOW OUR BUSINESS IS DOING

SALES IN APRIL (Bureau of Census) for airconditioning and commercial refrigeration equipment distributors, contractors, and wholesalers:

DOWN 19% from a year ago

DOWN 3% from previous month

SALES FOR 1961 so far are:

DOWN 7% from a year ago

INVENTORIES IN APRIL (Bureau of Census) for airconditioning and commercial refrigeration equipment distributors, contractors, and wholesalers:

UP 3% from a year ago

UP 3% from previous month

CURRENT LIABILITIES IN MAY for business failure of 1 airconditioning contractor with \$130,000 (Dun & Bradstreet). Compare this to:

5 failures totaling \$75,000 liabilities a year ago

4 failures totaling \$191,000 liabilities in April

GENERAL BUSINESS INDICATORS

	Latest Period	Previous Period	% Change
Housing Starts (thousands)			
Month ending 5/31/61	127.3	116.1	+ 9.7
New Construction , put in place (\$ billions)			
Month ending 5/31/61	4.8	4.3	+11.6
Unemployment (% of labor force)			
Month ending 5/31/61	6.9	6.8	+ 1.5
Manufacturers' Inventories (\$ billions)			
Month ending 4/30/61	53.4	53.3	+ 0.2
Manufacturers' Unfilled Orders (\$ billions)			
Month ending 4/30/61	46.1	45.6	+ 1.1
Retail Sales (\$ billions)			
Month ending 5/31/61	18.6	17.5	+ 6.3
Personal Saving (\$ billions)			
Quarter ending 3/31/61	28.3	27.2	+ 4.0
Disposable Personal Income (\$ billions)			
Quarter ending 3/31/61	357.2	358.1	- 0.3
Gross National Product (\$ billions)			
Quarter ending 3/31/61	499.8	503.5	- 0.7
Industrial Production Index (1957 = 100)			
Month ending 5/31/61	108	106	+ 1.9

Source: U.S. Dept. of Commerce

Industry use of galvanized steel up

Galvanized steel is enjoying new popularity for a variety of airconditioning and heating applications, according to American Iron and Steel Institute figures.

Product innovations in terms of improved paintability and weldability are expected to influence continued growth this year, says Armco Steel Corp.

A record tonnage of zinc-coated sheets was shipped directly to users for commercial airconditioning and ventilating equipment uses alone. The 148,918 net tons represents an 18% increase for 1960 over 1959 and a 9% bulge over 1958, the previous high year.

Latest NHAW figures show upturn

According to figures reported by members of North-American Heating & Airconditioning Wholesalers Association, sales and inventories for that group were up in April 1961 over last year and over March 1961.

Sales were up 5.75% over March and 7.15% over last April. Inventories jumped 2.23% over March and .83% over April 1960.

NHAW members report accounts receivable up 1.23% over March and down 1.68% from a year ago.

Rise in frozen food use predicted

Consumer demand for frozen foods is expected to show a modest increase this year, according to National Association of Refrigerated Warehouses. NARW reports frozen prepared foods will show a substantial growth.

Boiler shipments jump 12% in 1961

Shipments of residential cast iron boilers rose 12% for the first quarter this year while warm air furnace shipments dropped, the national Better Heating-Cooling Council has reported. Furnaces were down 2%, a decline of 4810 units.

Refrigerated warehouses set record

An all-time record was set May 1 when refrigerated warehouses reported holdings of 2.8 billion pounds of frozen foods, according to a recent U. S. Department of Agriculture cold storage report. This figure represents approximately 50% of the entire amount of frozen foods during 1959.

Continued on page 60



*

Joe Siegel,
veteran serviceman,
Ditmas Refrigeration Co.,
Brooklyn, New York.

"The Amprobe RS-3
is the most useful tool —
especially during peak
service periods. It saves
me an average of 30
minutes a job which, I
figure, allows me to
make an extra call a day.
And at that rate, the RS-3
pays for itself in a week
from 'found money!' Follow
me through a typical day. I'll prove it."

"Amprobe saves me two hours a day!"*

Call No. 1: Condensing unit on chest-type freezer defrosts. Fan runs, but unit won't start. Discovered motor starting resistance only 1.5 ohms, while running resistance was 5 ohms. Starting resistance should be at least 20% greater than the running, therefore windings defective. Without RS-3, I'd need sealed-unit starter kit and capacitor for power source to try to start head. If it could start, I'd have to take current readings; if it couldn't, I'd have to yank the head. **Time saved: 30 minutes.**

Call No. 2: Air conditioner not running. Amprobe showed input voltage okay. Keeping unit running manually from contactor, used RS-3 to check running current. Found it normal. Using RS-3 as ohmmeter, I located an open relay. **Time saved: 40 minutes.**

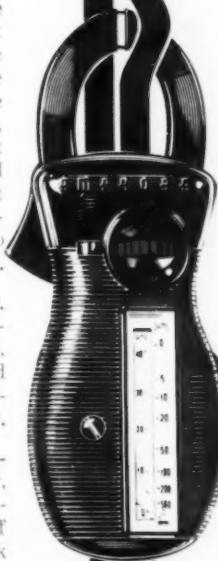
Call No. 3: Supermarket freezer not getting cold. Using Amprobe as ohmmeter, I found leads to heater element were carrying current even though time clock was off defrost cycle. Continuity check on clock

switch: okay. Tested heater leads and located a ground. **Time saved: 25 minutes.**

Call No. 4: Freezer running warm. Check disclosed that system in defrost. Decided that defrost thermostat at fault. Made sure (replacement is a big job) by measuring resistance of disconnected line to thermostat. Would have had to run live leads to hard-to-reach thermostat if not for Amprobe RS-3. **Time saved: 25 minutes.**

The total time saved in one day: 2 hours!

■ **14-DAY FREE TRIAL PLAN** ■ Try the RS-3 for two weeks under no obligation. If you're not completely satisfied, return it, and get your money back in full. Ask your distributor for complete details on the RS-3 and other time-saving Amprobe instruments. And for the full Joe Siegel story, write today for Reprint A616 to Pyramid Instrument Corp., Lynbrook, N.Y. Canada: Atlas Radio Corp., Toronto, Ont. Britain: H. J. Baldwin Co., Ltd., London, England.



Only \$52.50

(slightly higher outside U.S.)

Announcing the newest addition to the Amprobe family

NOW TEST VOLTS AMPS AND OHMS FOR \$29⁸⁵ ONLY

You read right. The AMPROBE JR. *Testmaster Kit* lets you *read* voltage on a calibrated scale (not just an indication), measure amps *without* interrupting service *and* test for resistance...at half the price you'd expect to pay for a tool of similar versatility

The Kit consists of the AMPROBE JR., an ohmmeter attachment, test leads, a leather carrying case and the AMPROBE *Energizer* ("splits" double-conductor cords for direct readings at outlets, or boosts the sensitivity of the instrument 10X for readings on fractional h.p. motors).

Pick the range that best fits your job from six rugged, lightweight models: 0-25 to 0-100 amp; either 0-125/150 or 0-150/600 volts AC; 25 ohms mid-scale. For more details about this newest addition to the most-complete family of pocket-sized, snap-around test instruments in the world, see your Distributor or write for Catalog sheet AAD-1.



PYRAMID INSTRUMENT CORP., LYNBROOK, N. Y.

Canada: Atlas Radio Corp., 50 Wingold Ave., Toronto.



At Dallas'
MERCHANDISE
MART
"Showcase
of the
Southwest"



Puracon is available in 1, 5, 15, 30 and 55 gallon containers.

New PURAICON means cleaner, odor-free air

"Our building is completely air-conditioned the year around. We have approximately 670,000 square feet of floor space and use 1250 tons of air-conditioning. By treating our 1200 filters with PURAICON, we can keep our indoor air pure and at the same time substantially reduce the intake of outside air, thus reducing our heat load. Puracon's easy rinse-ability simplifies the cleaning of filters and makes filter maintenance more economical."

Dave Hall, Jr.
Manager, Engineering Dept.
Merchandise Mart, Dallas, Texas

Mr. Hall is right, new PURAICON makes any filter an air purifier, hygienically cleans indoor air . . . kills air-borne bacteria and odors on contact.

PURAICON CUTS OPERATING COSTS

Puracon's efficiency cuts your heat load by reducing the need of outside air in your air circulating system to clear smoke, pollens, odors and air-borne bacteria.

PURAICON CUTS MAINTENANCE COSTS

Puracon is water soluble and contains no messy oil. Contaminated filters can be rinsed clean instantly in cold water without the use of cleaners or detergents.

You can cut the cost of cleaner indoor air in your building now . . . order PURAICON today.

PURAICON

MAKES ANY FILTER AN AIR PURIFIER

Write Worth Chemical Products Co., Box 366, Fort Worth, Texas, for complete information on pure air control with Puracon.

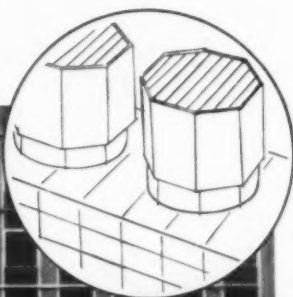


ALSO AVAILABLE IN CONVENIENT 16 OZ. AEROSOL CANS.

circle 69 on reader service card

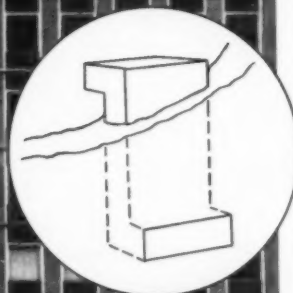
Aircoustat® silences noise

From basement to roof top...



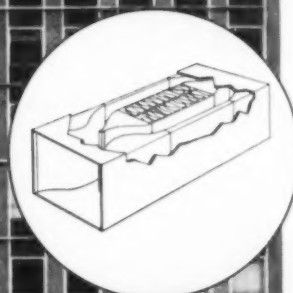
Cooling Tower Silencers

Water, fan and air noises are eliminated by Aircoustat Cooling Tower Silencers. Basic elements include intake sound proofing as well as exhaust mufflers. Because every building's requirements are special, every system is individually designed.



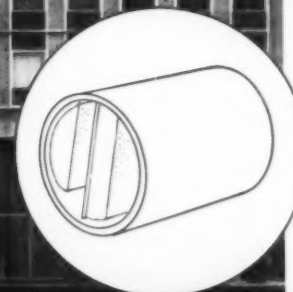
Return Air Vent Silencers

Block voices and other noises transmitted through transfer grills. Aircoustat Return Air Vent Silencers trap sound but not air. Available in three configurations and six stock sizes. Adaptable to a variety of installations—doors, walls, ceilings, etc.



Standard Duct Silencers

These low-cost, pre-engineered units assure a lifetime of trouble-free, maintenance-free service. Pre-determined values eliminate guesswork, *guarantee* the right attenuation. More than 60 stock models, fabricated in six lengths, available "off the shelf." No local job adjustments, no fabrication.



Circular Silencers

High velocity air system sounds need not be excessive if proper consideration is given to attenuation. An Aircoustat Circular Silencer adjacent to the fan does the job. Designed especially for higher pressure systems as well as for standard cylindrical ductwork. A full range of standard sizes available.

Selecting performance guaranteed AIRCOUSTAT units is quick and accurate. We'll be pleased to supply you with complete technical and ordering information on any or all silencers in the line. Write: KOPPERS COMPANY, INC., 3108 Scott Street, Baltimore 3, Maryland.



SOUND CONTROL

Engineered Products Sold with Service

circle 32 on reader service card

USEFUL Literature

A NEW EDITION of Catalog 10-B on R-P&C valves has been published by R-P&C Valve Div., American Chain & Cable Co., Inc. The 16-page release gives illustrations with condensed descriptions and specs on bronze, iron, body and cast steel gate, globe and angle and check, barstock, and forged steel gate valves. Numerous charts, tables and dimensions are also included.

circle 206 on reader service card

INTRODUCED in Bulletin DB5-100, from Ilg Electric Ventilating Co., are lower priced manual and automatic controls for electric unit heaters with capacities from 1½ to 36 kw. The release supersedes Bulletin 809. It contains information, specs, and illustrations on commercial and industrial heaters.

circle 207 on reader service card

FOR EVERY NEED there's a Reznor heater is the claim of Catalog SA-5900C from Reznor Mfg. Co. on its direct fired heaters. There are numerous product photos and drawings which are accompanied by series, major differences, Btu input capacities and type and use. Performance data and specifications tables are listed for each type of heater. Also included are optional features, applications, and recommended arrangements of duct furnace and blower.

circle 208 on reader service card

A "HOW TO" CATALOG is Econo Products Co.'s release on its "Zone-A-Trol" damper actuators. It tells how to install them to provide individual room temperature control or zone control, and how they can be installed in any shape or size duct to control the heating or cooling air flow. There are three plan views of exemplary uses of the product, several product photos, and many application sketches.

circle 209 on reader service card

THE FIRST all-inclusive publication, CGR-15501, issued in eight years by Drayer-Hanson Div., Hi-Press Air Conditioning of America, Inc., is titled "Commercial Refrigeration Units by Drayer-Hanson." It catalogs, with ample photo detail and captioned application/specification data, the firm's eight lead lines for above and below 32 F. There is detailed information on meat cutting/packaging room units, unit coolers, hot gas and water defrost units, evaporative condensers, air-cooled condensers, hot pan unit coolers, product coolers, and cooling towers.

circle 210 on reader service card

FOUR TYPES of propeller fan-powered roof ventilators are featured in Bulletin A-112E, published by Hartzell Propeller Fan Co. It includes details, specifications, dimensions, and performance data on the four types and also has data on penthouses and stack caps. A visual guide of products, engineering data, air deliveries, and photos complete the release.

circle 211 on reader service card

SAFEGUARD AGAINST unauthorized entry and injury to personnel by using General Electric Co.'s J1C combination safety starters is the message of release GEA-7321. A call-out photo illustrates safety devices and sequence photos show how to perform inspection or maintenance with or without power interruption. Outline dimensions, ordering directions, pricing information, and advantages of the safety door design are also included.

circle 212 on reader service card

Continued on page 70

MINIMUM INVENTORY— GENEROUS PROFITS

Service Air Conditioning Controls with
Identical Parts Used in Original Equipment

Only 20 starting relay kits will replace 355 various items.

Only 19 control relay kits will replace 142 various relays, contactors, controllers.

Same-day-shipment on parts ordered from RBM Chicago warehouse.

NOW! GENUINE

RBM REPLACEMENT KITS

For the first time, RBM offers kits for direct replacement of the magnetic controls it has engineered and built as original equipment for all major air conditioning manufacturers. Their requirements have been consolidated into a few replacement kits. This, plus same-day-shipment of orders from the Chicago warehouse stocks, keeps your inventory down. Because RBM original equipment and replacement controls are manufactured on high volume production lines, costs are low... and you benefit from the saving in generous profit margins.



Wholesalers... be sure and ask for a free supply of the new RBM pocket size REPLACEMENT KIT BROCHURE. Your customers will appreciate them.

Order your replacement kits from our Chicago Warehouse, 3501 W. Addison, Chicago 18, Illinois.

RBM Controls Division

Logansport, Indiana

Factories: North Manchester and Logansport, Indiana.

For technical information write or phone:

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**Spark your next sales
meeting with reprints
of the article
everybody's talking
about**

**I tried to buy
AIRCONDITIONING
for a store**

Over 12,000 reprints already sold!



Make sure your organization knows about the poor sales practices of some commercial airconditioning contractor-dealers. This important and revealing field study was presented in the June issue. Because of the great response, reprints are now available to the entire industry at these special prices:

1-9 reprints @ 35¢ each
10-49 reprints @ 30¢ each
50-99 reprints @ 25¢ each
100-499 reprints @ 20¢ each
500-999 reprints @ 15¢ each
1000 or more reprints, please request quotation

Address your orders to: REPRINT DEPARTMENT

The REFRIGERATION & AIRCONDITIONING
Business |

812 Huron Road • Cleveland 15, Ohio

**DON'T
READ
THIS...**

**JAMES SCHMIDT,
MACHINIST, DEAD IN
TRAFFIC ACCIDENT**

MIDDLETOWN, Jan. 21

James Schmidt, 47, of Elm Street, a lifelong resident of this city, died when his car ran off the road and overturned. The State Police report that Mr. Schmidt was dead on arrival. They believe that he must have fallen asleep at the wheel, since the car showed no mechanical defects. He was returning home from a hunting trip.

READ THIS!

AND LEARN HOW YOUR COMPANY
CAN REDUCE OFF-THE-JOB ACCIDENTS...
AND THEIR SHOCKING TOLL
OF WASTED LIVES AND DOLLARS.

Until recently, executives have felt there was little they could do to control the rising total of nonwork accidents. But the experience of many companies with the TOTAL SAFETY PLAN developed by the National Safety Council shows that industry can reduce these accidents—by as much as 30%!

Here's proof from one of America's largest companies. They lowered their nonwork accident rate by $\frac{1}{3}$ in just five years, using this Total Safety Plan! Even more remarkable, they cut their employee auto fatality rate to 85% below the rate for all U.S. workers! And they shaved another 50% off their already low in-plant accident rate!

YOUR COMPANY CAN ACHIEVE THE SAME KIND OF RESULTS

When you prevent an off-the-job accident you not only help save a life, but you help stop a serious drain on your company's profits. The average nonwork accident costs employers \$72. The average company grossing \$1 million nets around \$73,000. If this company prevents ten nonwork accidents, it can add 1% to net!

The booklet "The Challenge to Management of Off-the-Job Accidents" will show you how to figure your company's nonwork accident rate and costs. It will show you many proved ways in which you can preserve precious lives and profits. Send the coupon for your copy today.



THE
CHALLENGE
TO
MANAGEMENT
OF
OFF-THE-JOB
ACCIDENTS

Published to save lives
in cooperation with
The Advertising Council
and the National Safety Council



**SUPPORT YOUR LOCAL
SAFETY ORGANIZATION**



NATIONAL SAFETY COUNCIL
425 NORTH MICHIGAN AVENUE
CHICAGO 11, ILLINOIS

Please send a copy of "The Challenge to Management of Off-the-Job Accidents." I want to learn how my company can save lives and dollars with your TOTAL SAFETY PLAN.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

"Here's why I standardized on H&M cooling towers

...they're the only towers with a 20-Year Guarantee on the wetted deck surface!

"In my town, most air conditioning and refrigeration buyers prefer cooling towers for their installations. But local water conditions are pretty hard on the fill. Fungus and algae grow fast and furious—so fast that the accumulation actually blocks air flow and cuts tower capacity!

"After trying several makes, I standardized on H&M Cooling Towers. *The wood fill is specially treated with creosote applied under pressure*, and water plants and animals can't live on that! That's why the

Halstead & Mitchell towers carry a 20-Year Guarantee on the wetted deck against failure due to fungus attack or rotting."

If you want towers that will last, and need a minimum of care, you should find out about H&M towers. Call your local parts wholesaler or write for Bulletin EC-500 (Propeller Fan Towers, 3 to 150 tons) or Bulletin ECKB-601 (Centrifugal Fan Towers, 5 to 30 tons). Halstead & Mitchell Co., Dept. D-8, Bessemer Building, Pittsburgh 22, Pa.



Halstead & Mitchell

Cooling Towers • Air-Cooled Condensers • Air Handlers and Coils • Water-Cooled Condensers
Export Representatives: Sabal-Kielmann, Inc., 15 William St., New York 5, N. Y.

circle 25 on reader service card

UNSURPASSED FILTERING AND DRYING with ADDED Convenience and Economy... It's the New Refillable Type *Drymaster*[®] Filter-Drier!

The superb, balanced filtering and drying performance of the new refillable type DRYMASTER comes from HI-FI Filter Block Desiccant: These fully activated, pressure molded briquettes quickly remove all harmful moisture, acid, sludge and micron-size foreign particles from the refrigeration system. HI-FI Filter Block Desiccant is non-dusting, non-channeling and is virtually unequalled in moisture adsorbing capacity. Its combination surface and internal depth filtering ability is unsurpassed by any other comparably sized drier in the field today.

And the new angle-type, refillable DRYMASTER Filter-Drier gives added convenience and economy, too. Once installed, the body shell of the Drier is in for the life of the system; only the desiccant is replaced. DRYMASTER Refillable Filter-Driers are designed for 5 ton through 165 ton capacities with 1/2" O.D. through 2 1/4" O.D. solder connections. End fittings are made of copper for easier soldering.

HI-FI Desiccant Briquettes, protected against shock by fibre glass padding, come packed in vacuum sealed cans ready to be installed quickly, easily, with no connections or joints to remake.



Write today for Catalog R-159 . . . contains complete information on all Streamline Refrigeration and Air-Conditioning products.

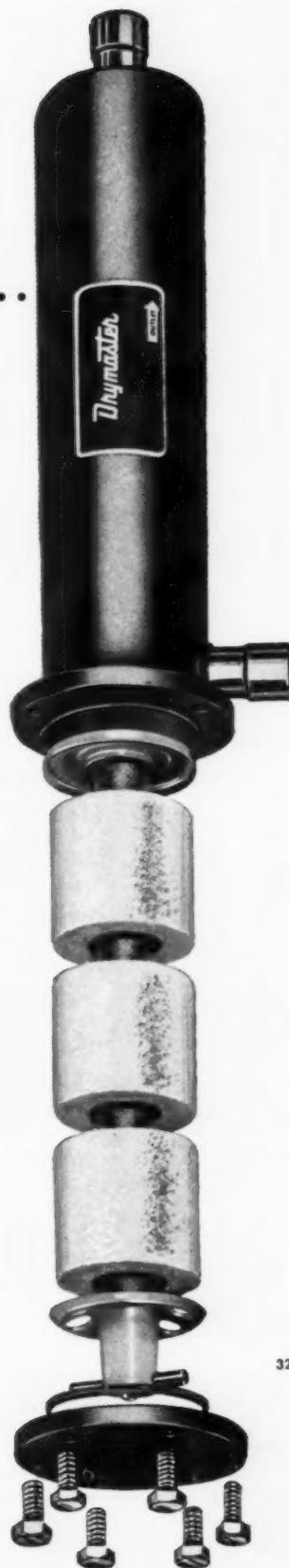


MUELLER BRASS CO.
PORT HURON 14, MICHIGAN

VAMPCO ALUMINUM PRODUCTS, LTD., STRATHROY, ONTARIO
Exclusive Canadian Representative for Mueller Brass Co.
Air Conditioning and Refrigeration Products

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/AUGUST 1961



322



©1961 Volkswagen of America, Inc. *Suggested Retail Price, East Coast P.O.E.: \$1,995 West Coast.

Three (3) tailgates!

Plunk.
Plunk.
Plunk.

All 3 sides drop on our Volkswagen Pickup.

You don't have to load everything from the back and drag it forward—as with models with only the rear gates.

You don't unload everything just to get something from the front, either.

J. C. Pressley & Company of St. Peters-

burg, Florida, uses 24 VW Trucks to deliver heating and air conditioning equipment.

Our hinged sides make it easy for them to load big duct sections from any position. And the VW hardwood floor ribs help keep cargoes from shifting.

Our bed is 8½ feet long. There's no wheelwell, either. You can use every inch.

Records kept on one Pressley VW showed that in 9,447 miles it averaged circle 64 on reader service card

20 miles a gallon. Even though Pressley spends hours in stop-and-go driving right in their own yard, month in and month out.

(Some VW owners get 30 mpg. Our average is about 24.)

But of course your first saving comes the day that you buy a Volkswagen.

The price is \$1,885.* Tailgates and all.



**Raise Your Profit by Cutting
Unnecessary Installation Costs**



**Specify DUNHAM-BUSH 'LSCU'
Low Silhouette Condensing Units**



**...Furnished Completely
Packaged... All Piped and Wired**

No unexpected extra installation charges when you select Dunham-Bush 'LSCU' Low Silhouette Condensing Units (or 'LRCU' vertical models). Available in five basic sizes, 10 through 30 tons, these completely packaged, ready to install units are specifically designed for air conditioning applications requiring use of water savers.

The 'LSCU' is basically a standard 'LSBC' low silhouette blower condenser, complete with a Brunner-Metic motor-compressor, Heat-X liquid receiver, electrical controls, and refrigeration accessories mounted in a specially designed section for field attachment or remote installation.

These units can be located anywhere without regard to prevailing winds. The air movement, up and out, means minimum noise ratings and no objectionable air flow toward neighboring buildings.

Request form no. 7017 and 7017-1 for complete data.

DUNHAM-BUSH

DUNHAM-BUSH, INC.

WEST HARTFORD 10, CONNECTICUT, U. S. A.

SALES OFFICES LOCATED IN PRINCIPAL CITIES

circle 19 on reader service card

Product DATA

Remote airconditioner

Product: Remote air-cooled air conditioner (Model 30 DNR).

Manufacturer: Day & Night Mfg. Co., La Puente, Calif.

Features: Is rated at 30,000 Btu at 95 F and is only 44½ x 16½ x 25-13/32". Side-intake top-discharge pattern of handling condenser air results in slim lines and direction of fan operation and air movement upward for quieter performance. Condenser coil is 5.53 sq.ft., 3-row design with ¾" tubes and 13 rippled-surface aluminum fins per inch. Includes liquid refrigerant sub-cooler and liquid sight-glass with moisture indicator. Fan is 16" propeller type powered by ¾-hp, 1050-rpm motor. Unit equipped with 3500-rpm compressor in partitioned compartment, factory-charged with R-22 for 25' of line. Controls include compressor contactor, transformer, high and low pressure controls. Liquid and suction-line service valves provided.

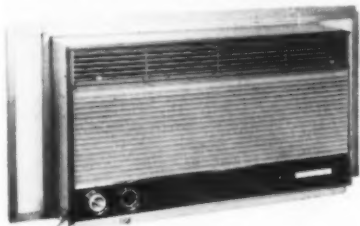
circle 136 on reader service card

Room unit wing panels

Product: Adjustable wing panels and mounting frames for room airconditioners up to 9600 Btu capacity.

Manufacturer: Carrier Air Conditioning Co. Div., Carrier Corp., Syracuse, N.Y.

Features: Now available as optional equipment on firm's "Sceptre" line of six models, including two heat pumps.



Panels and frames eliminate need to cut and fit panels and attach support bracket to window exterior. Frame holds vinyl panels and sliding wings lock for weathertight fit. Room units 14 x 16 x 26½"; available for 115, 208, and 230 v.; and in 7000, 9000, 9600 Btu capacities.

circle 137 on reader service card

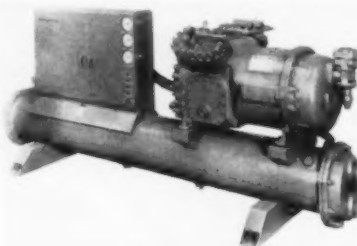
Hermetic condensing unit

Product: Model CNU hermetic condensing unit from 20 to 60 tons with two types of starters.

Manufacturer: Air Conditioning Div., Westinghouse Electric Corp., Staunton, Va.

Features: Has standard suction operating temperatures from 20 to 50 F. Six voltage ratings at three phase, 60 cycles: 208, 220, 240, 480, and 550; three

ratings at three phase, 50 cycles: 220, 380, and 400. All equipped with either line-start or part-winding-type starters. Consists of water-cooled condenser, hermetic compressor, control center. Is factory assembled, prewired and prepped,



and has vibration mountings under compressor. Other standard items: starters, safety controls, gage panel, internal control and power wiring between control center and compressor. Compressor has quick-trip overload relays that protect against excessive instantaneous motor currents.

circle 138 on reader service card

Cleaning compound

Product: "Swish Elektrokleen" cleaning compound for power tools, fans, ductwork.

Manufacturer: Montgomery Chemical Co., Jenkintown, Pa.

Features: Available with removable extension tube for cleaning out-of-way places and with pinpoint spray for miniature parts. Polypropylene tube flexible for spraying around corners. Compound without extension gives long range, drenching spray.

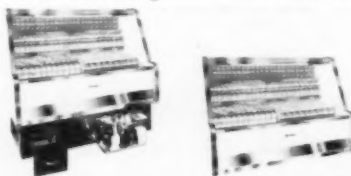
circle 139 on reader service card

Dairy merchandiser

Product: Narrow dairy and milk merchandiser.

Manufacturer: Frigid Igloo Mfg. Corp., Yonkers, N.Y.

Features: Only 24" wide, has duobody welded steel construction with separate inner and outer shell. Exterior and interior of white baked enamel applied on two types of steel. Precision engineered refrigeration for remote installation, heavy duty coils and fans for fast, efficient cooling. For self-contained cooling, is equipped with hermetically sealed condensing unit. Time clock de-



frosts automatically. Self-contained model (shown) has front pullout unit and front slide-out condensate drain pan. Self-contained models: 4'4" lengths only, 34" deep, 69" high; remote models: from 4'4" to 16'4" lengths, 34" deep, 54" high.

circle 140 on reader service card

Speed recorders

Product: Visible mph and rpm speed recorders.

Manufacturer: Service Recorder Co., Cleveland, Ohio.

Features: Mph recorder (bottom) marks speed, time, mileage on 24- or 72-hour charts, has red warning light preset at 50 mph, and shows miles and tenths in increments of 5 mph from 0 to 70 on odometer that goes to 1 million miles. Rpm recorder (top), for off-highway and diesel equipment, shows engine speed, time, engine idling. Dial marked in increments of 100 rpm. Has amber light to indicate overdriving and



red light for lugging. Both units make records by stylus on wax-coated circular 6" chart and for use when speedometer, or tachometers not desired. Truck drive cables connect directly into recorder base. Independent spring-loaded pointer allows stylus to make record though visible pointer blocked.

circle 141 on reader service card

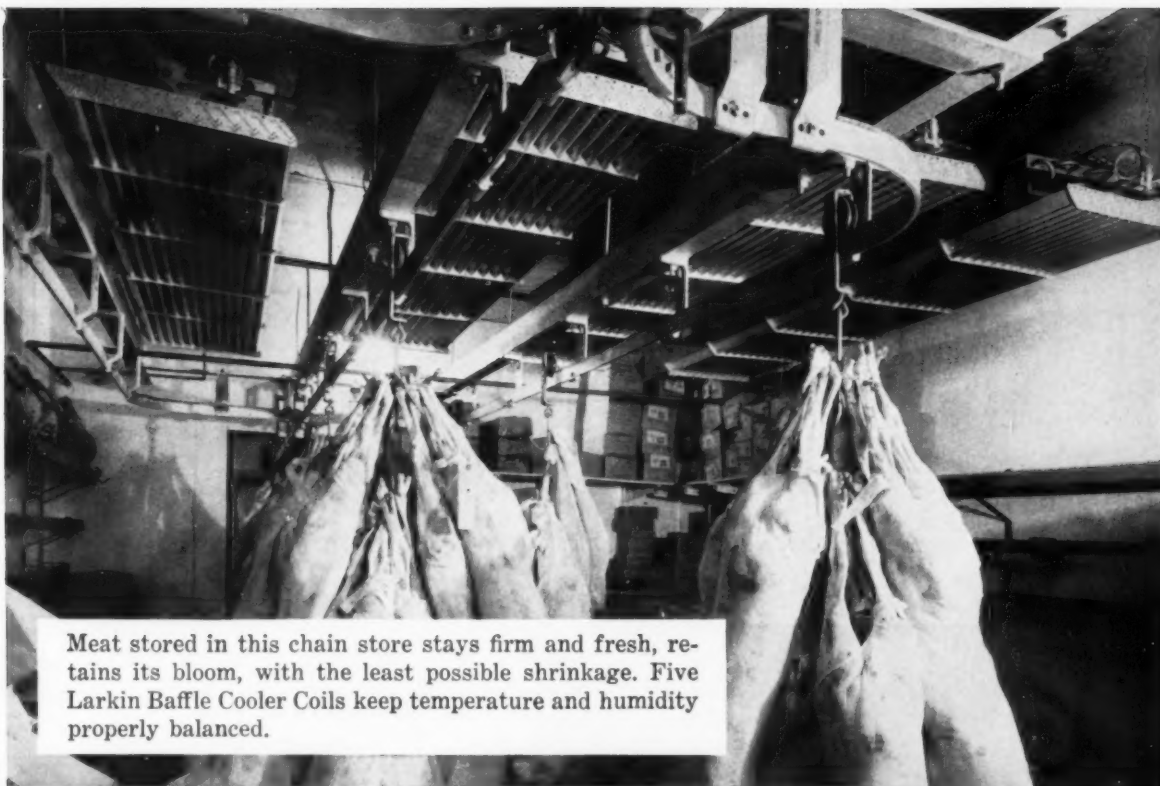
Remote fan-coil units

Product: Five basic remote fan-coil units for custom room airconditioning.

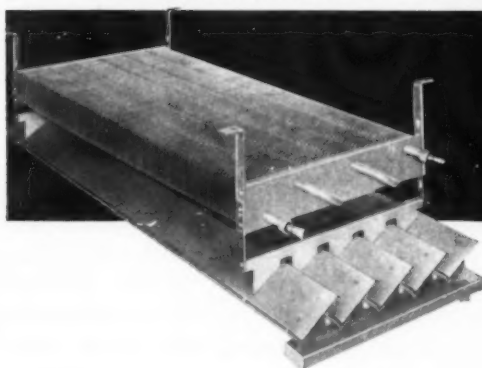
Manufacturer: Airtemp Div., Chrysler Corp., Dayton, Ohio.

Features: Capacities from 200 to 700 cfm. Supplement packaged water chillers and air handling units. One floor model is cabinet type, other is recessed type for permanent hidden installations. Two ceiling units consist of cabinet and re-

Continued on page 72



Meat stored in this chain store stays firm and fresh, retains its bloom, with the least possible shrinkage. Five Larkin Baffle Cooler Coils keep temperature and humidity properly balanced.



LARKIN baffle cooler coils keep meat in top condition

OUTSTANDING FEATURES

- Patented Larkin cross-fin coil with aluminum fins and staggered, electro tin-plated, copper tubes, mechanically expanded.
- Baffles are constructed of heavy-gauge, polished aluminum.
- Coil and baffle hangers are heavy-gauge die-stamped aluminum channel punched with keyslots for easy attachment.
- Matched baffles for left and right sides furnished if specified.
- Special-sized baffle cooler coils are also available.

Smart retailers look to the refrigeration contractor-dealers for systems that keep meat in the best possible condition—firm with good bloom, minimum shrinkage. Such meat sells better without wasteful trimming, hence yields more profit.

Let us show you the astonishing graphic results we have obtained under actual applications with Larkin Baffle Cooler Coils.

See your wholesaler
or write for Bulletin 1057.



LARKIN COILS

INC.

519 Memorial Drive, S.E. • P. O. Box 1699 • MURRAY 8-3171
ATLANTA 1, GEORGIA

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NEW!

BENDIX-WESTINGHOUSE

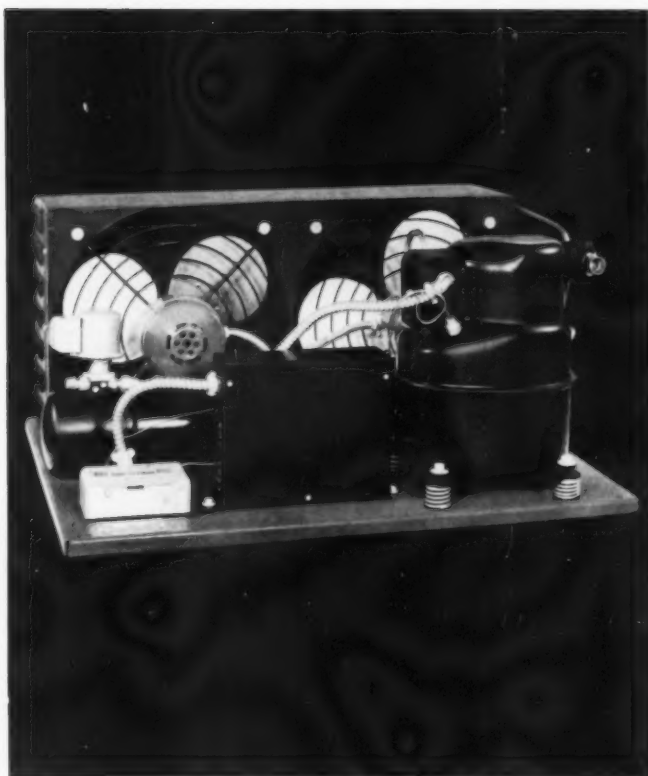
2- AND 3-HP R-12 CONDENSING UNITS

1-PHASE

OR 3-PHASE!

AIR- OR WATER-

COOLED



If you have a high back-pressure application—such as bulk milk coolers, water chillers, walk-in coolers, or air conditioning installations—you'll be particularly interested in the rugged new Bendix-Westinghouse condensing units.

Using R-12 refrigerant, these 2- and 3-hp condensing units are specifically engineered for just such applications. Their two-pole motor compressors save weight over standard four-pole units with the result that shipping costs are lower and required installation space is less.

Other advanced design improvements are many and include: latest-type motor insulation, full suction gas cooling, positive pressure lubrication, and inherent overload protection. They all add up to longer-lasting, quieter, more efficient operation. These units are available in either 230-volt, 60-cycle, 1-phase or 208/220-volt, 60-cycle, 3-phase models—air- or water-cooled.

Free literature on these new economy-minded Bendix-Westinghouse condensing units is yours for the asking. Write . . .

Bendix-Westinghouse

EVANSVILLE, INDIANA

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

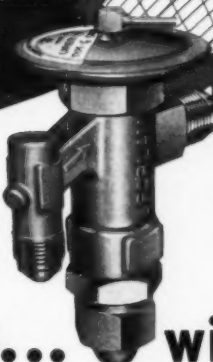
Export Sales: Bendix International, 205 E. 42nd St., New York 17, N. Y.; Peter A. Karl, Inc., Union Station Bldg., Utica 2, N. Y.; Sabal-Kielmann, Inc., 15 William St., New York 5, N. Y.

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A Picture is Worth
A THOUSAND WORDS

it's the
PEAK PERFORMANCE
PICTURE
of...

SPORLAN



G Valves... with Selective Charges

***and it explains better than words why they
are the No. 1 choice for all refrigerated cases***

The many features of the G Valve are Sporlan originals that have resulted in this Peak Performance story... Constant improvement for maximum operating efficiency includes: simplified design... large flat stainless steel diaphragm... durability... leak proof construction... all working parts accessible... selected materials for internal parts offer maximum protection against corrosion and erosion... and in addition, the famous Sporlan engineered Selective Charges:

- C** for suction temperature Above Zero
- Z** for suction temperature Below Zero
- X** for extremely low temperatures

***For the complete story on the G Valve and other Sporlan thermostatic expansion valves with Selective Charges
write today for your copy of Bulletin 10-10.***

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7525 SUSSEX AVENUE ST. LOUIS 17, MISSOURI
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Quiet...



WAGNER Polyphase Resilient Mounted Motors in ratings through 10 horsepower

Quiet, vibration-free performance is essential when motors are installed in areas where noise must be held to a minimum . . . in hospitals, churches, schools, office buildings, restaurants and similar locations where quiet is needed or wanted.

Such installations have created a need for larger polyphase motors that whisper while they work. Wagner has met this need by expanding its line of polyphase resilient mounted motors to include standard ratings through 10 hp.

You certainly have applications that call for a smooth running motor, cushioned by resilient mountings. To make sure they're quiet, specify Wagner Poly-

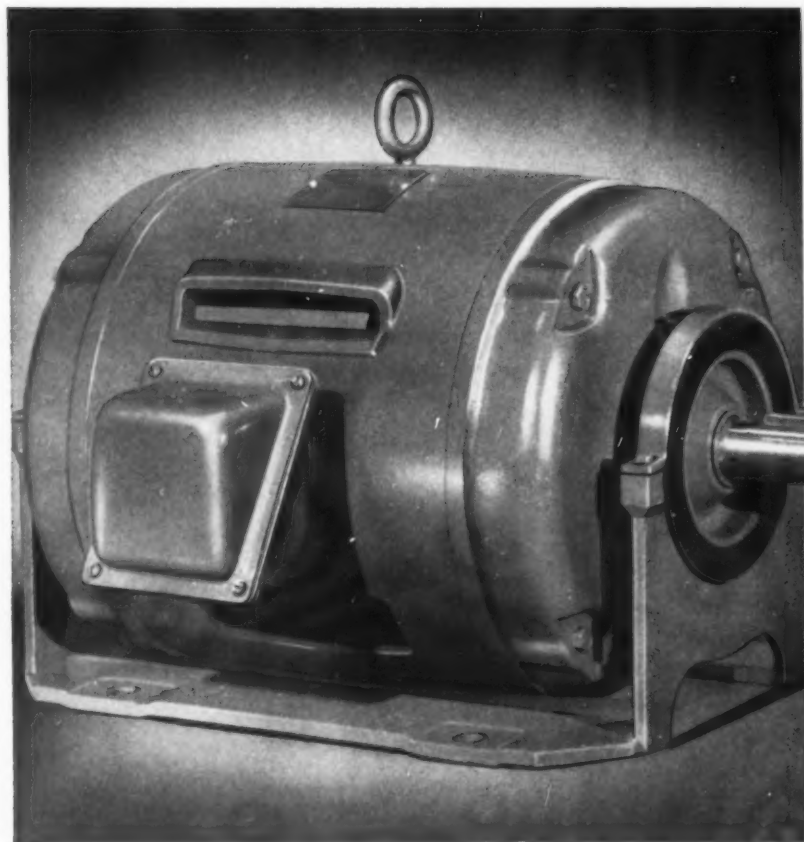
phase Resilient Mounted Motors. Only Wagner can provide an entire range of ratings through 10 hp.

Constant research and development have kept Wagner up front in electric motor design for more than 65 years . . . made the name Wagner one you can depend on in choosing electric motor drives.

Your nearby Wagner Sales Engineer can help you select the right motor to meet your requirements. There are Wagner branch offices in 32 principal cities.

Wagner Electric Corporation
6442 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

WM60-14



SLEEVE OR BALL BEARING

These motors are furnished with quiet running steel-backed babbitt-lined sleeve bearings of high load carrying capacity. Ball bearings can be supplied when desired.

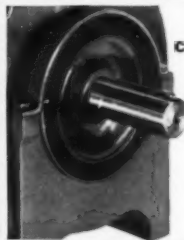


CEILING, SIDEWALL OR HORIZONTAL MOUNTING

You can mount these motors on walls or ceilings by rotating the cradle base 90° or 180°. Motor stays dripproof.

NEOPRENE CUSHIONING RING

Annular mountings, of oil-resistant neoprene bonded to steel rings, cushion the motor in its cradle base to absorb the small amount of vibration that remains in the most carefully balanced motor.



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M-PAK MODULAR PACKAGES...A NEW ADDITION TO B & G[®] AIR CONDITIONING AND REFRIGERATION EQUIPMENT

A COMPLETE LINE OF REFRIGERATION AND AIR CONDITIONING COMPONENTS



B&G CONDENSERS

Lighter, more compact units, featuring quiet, vibration-free operation, uniform gas distribution, cleanable tubes and higher operating efficiencies.



B&G EVAPORATORS

Featuring non-slugging design...tube bundle proof against freeze-up damage...positive oil return.



B&G SUCTION LINE HEAT EXCHANGERS

Aid thermal expansion valve operation, prevent liquid slugging.



B&G COMPRESSORS

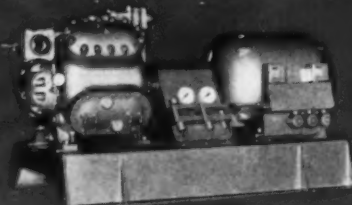
Precisely engineered for vibration-free operation with all the advantages of "open" units. All units have one bore—a few interchangeable parts service them all.



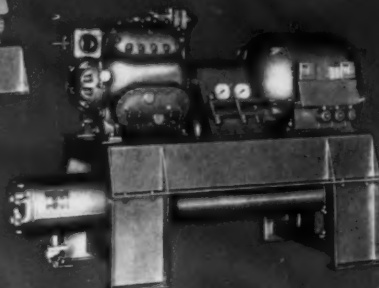
B&G CENTRIFUGAL PUMPS

A full range of quiet pumps for refrigeration and air conditioning systems.

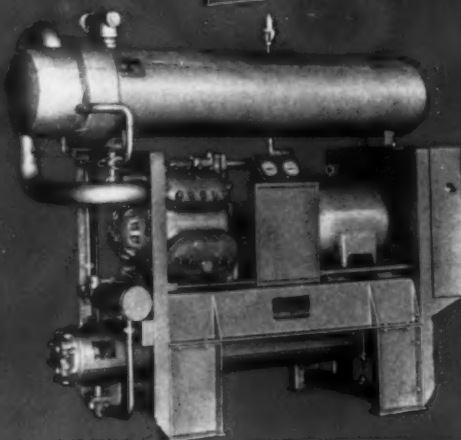
1 MOTOR COMPRESSOR



2 CONDENSING UNIT



3 PACKAGE LIQUID COOLER



B & G[®] MODULAR PACKAGES

Modular packages increase availability...speed-up delivery

In its M-Pak Modular Packages, B&G presents a new advance in efficiency designing of air conditioning and refrigeration equipment. M-Pak units are built around five basic sizes of open-type compressors. Factory-stocked motors, condensers, evaporators and controls can be added to these basic units to make a comprehensive line of "packages" of from 7½ to 150 tons.

1. For example, motor compressors are produced by adding a B&G-built motor to a B&G basic compressor. 2. Further addition of a B&G condenser and a standard base makes a condensing unit. 3. Addition of evaporator and control panel results in a package liquid cooler.

All major components of M-Pak units are designed, manufactured, and guaranteed by B&G...one responsibility for the entire package. This, we believe, is an exclusive feature.

B&G also makes a complete line of refrigeration and air conditioning evaporators, condensers and centrifugal pumps—with many commonly used sizes available for immediate shipment from factory stock.



BELL & GOSSETT

C O M P A N Y

Dept. GT-45, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario
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RECENT *Installations*

Chiller passes college press exam

A 30-TON WATER CHILLER HAS solved the publishing test posed by bad well water formerly used to cool the press and other equipment of Wesleyan University Press, Inc., Columbus, Ohio, publishers of school books. For several years the equipment was cooled with well water until a bad water condition forced the publisher to abandon its wells and pipe in city water.

But the high cost of the city water swung Wesleyan officials over to mechanical refrigeration. The Chrysler Airtemp chiller plus a 120-ton cooling tower and a 1200-gal. inside sump tank were the answer. The packaged chiller delivers controlled temperature water to four press rollers, the ink conditioner, the bearings on the rollers, a 200-hp dynamatic clutch, and an electric eye.

Hidden, safe cooling for jail

CRIMINALS IN SARASOTA, FLA., MUST think crime just about pays off, because when they're caught they can spend their "time" in the airconditioned city jail. But it's not a gilded cage because the cooling comes with escape-proof ductwork and tamperproof controls.

The contractor's biggest headache was to keep the Spanish architecture yet hide 150 tons of centrifugal equipment, 30 small fan-coil units, a cooling tower, and 19 large air handlers. He did



it by moving the Airtemp equipment into a basement room, by installing the water tower piece-by-piece in the bell tower, and by camouflaging the air handlers in the false ceiling of the public and business offices. Mahogany-covered fan-coil units are in offices on the first three floors.

Air Comfort, Inc., Sarasota, was the installing contractor.

Wrot iron pipe heats ice rink

FIFTY-FIVE TONS OF 1½" DIA. WROT iron pipe spaced on 4½" centers are used in the radiant heating system of the Maurice Richard



ice rink in Montreal's new \$2.5 million sports center. The 85 x 190' rink requires 150 tons of refrigeration.

The system has 1" dia. wrot iron pipe fabricated into sinous coils laid on 6" centers in the stands and then encased in 2" of concrete. Coils along the side of the rink are also spaced on 6" centers and covered with 2" of concrete with terrazzo surface. Supply and return piping is of 8 and 2½" dia. wrot iron pipe. The iron radiant heating keeps floors warm, eliminates cold air currents along floors, cuts down dust for pure air within the building, and cools areas where humidity isn't high.

The heating system uses 110 F water that is circulated through the piping. For cooling, a brine solution is circulated through the piping and pumped from brine tanks beneath the rink. All of the piping was manufactured by A. M. Byers Co.

Continued on page 62

Spotted leaks other detectors missed . . . result:

"MY H-6 PAID FOR ITSELF ON ONE JOB" . . .

says MR. FRED SKAFF (shown here),
Skaff Refrigeration Service,
Lawrence, Massachusetts

"That's right," reports Mr. Fred Skaff, "thanks to General Electric's Type H-6 leak detector I was able to repair ten discarded refrigerators . . . 'leakers' that other, less sensitive detection devices couldn't handle. What's more, I resold these refrigerators at a profit four times greater than H-6 purchase price."

Like many other refrigeration and air-conditioning servicemen, Mr. Skaff has discovered that the H-6's greater sensitivity pays off. This halogen detector consistently spots *all* troublesome leaks in seconds . . . even those as small as 1/2 ounce per year. So . . . no costly call-backs . . . more calls per day . . . greater profits with the fast, dependable H-6.

Find out now how quickly the H-6 pays for itself. Your local air-conditioning and refrigeration wholesaler will gladly demonstrate the many ways the H-6 can help you improve service and increase profits. Ask him about the new, convenient H-6 finance plan. For the latest H-6 product bulletin simply fill-out and mail the coupon below to Section B598-06, General Electric Co., Schenectady 5, N.Y.

INSTRUMENT DEPARTMENT

GENERAL  ELECTRIC



Find out for yourself why
Distributor Dan says you save
time and boost profits with a
G-E Type H-6 Leak Detector...
clip coupon and mail today.



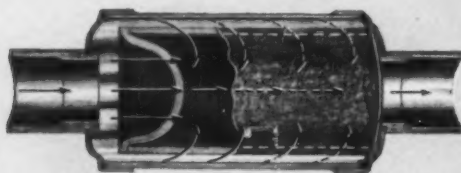
General Electric Co.
Section B598-06
Schenectady 5, N. Y.

Please send by return mail, Bulletin GEA-6827, on "The Type H-6 Leak Detector."

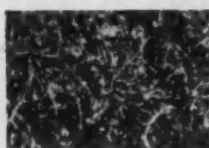
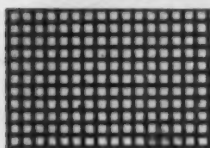
Name _____
Title _____
Company _____
Address _____

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Eliminate these causes of HERMETIC BURNOUTS!



27 times more effective than 100 mesh screen



PERMACLEAN Filters have a specially processed filter element in an all-brass shell. The filter element filters out particles as fine as 5 microns. Photos show why thousands of filter crevices entrap more and finer particles than 100 mesh screen. (Both magnified 8 times).

**Sludge—Chips—Flux—Solder—
Rust—Metallic Salts...**

**Remove them all with
SUCTION LINE**

Permaclean FILTERS
LOW MICRON

HERMETIC BURNOUTS are often caused by the presence of the above contaminants in the system. They not only cause dangerous reactions, but score cylinders—clog passages—cause sticky valves and do much to harm the system.

PREVENTION is simple and inexpensive. Install low cost, high-capacity PERMACLEAN Filters for permanent service on the suction line ahead of the compressor. All sludges and solid particles are removed from the oil and refrigerant.

PROTECT new, rebuilt and established systems with PERMACLEAN Filters. They are scientifically designed for suction line installation, proved by years of service. See your wholesaler or write us for Bulletins D-7 and A-12.

Use the Filter-Driers with TRUE Double Action!

M FILTER-DRIERS

McIntire M Filter-Driers are the only filter-driers that give 100% separate drying action and filtering action. They take up more moisture—take out more contaminants—stay on the line longer, yet cost no more than less efficient units. The gleaming, polished and lacquered all-brass spun shells are corrosion-resistant, strong, attractive.

Buy M Filter-Driers at your wholesaler in many connection sizes from 1/6 to 10-ton systems.

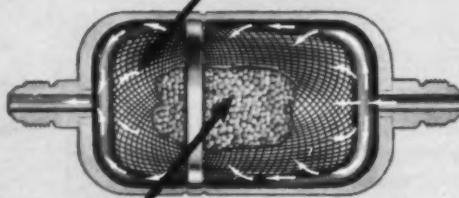


THE McINTIRE COMPANY

Livingston, New Jersey

Since 1925—Specialists in Drying, Filtering, Straining.

Get "MICROWALL"
—the complete
filtering system



Plus **Permasorb** high capacity desiccant
WITH MOLECULAR SIEVES

Note that the entire bed of Permasorb desiccant is encased inside the protective "Microwall" filter. All inlet refrigerant and oil are first filtered—then pass through the bed of desiccant—and again are filtered at the outlet. The desiccant does not filter—stays clean and unclogged to give 100% drying effectiveness. Permasorb is the original, time-tested, balanced blend of Molecular Sieves and Activated Alumina in hard bead form. No binders, no powdering, no packing.

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LET'S TALK *Business*

Price cutting and profits don't mix

THERE'S NOTHING NEW about price cutting in our industry. No formula has yet been developed that permits an installing contractor-dealer to cut prices and profits and stay in business.

We are essentially a mechanically-trained industry and our financial failures, at the installing level, are primarily due to poor business management. The installing contractor-dealer who cuts prices to the point of excluding profits has taken the first tragic step along the road from which there is seldom a return to stable profits.



We have our chronic problems of weather, overproduction, and excessive inventories, establishing a business climate for price reductions.

Let's consider two important factors about price cutting:

First, little new business is created by a sales program that includes price cutting at the sacrifice of profits.

Second, and more important, is that you, the installer, must decide whether or not your organization is going to engage in the futile practice of price cutting.

Are you going to stand firm on good products, installed and serviced properly? Or are you going to sell inferior products and cut corners on installation and service, all obvious symptoms of the price-cutter.

It's your choice.

If you are grimly determined to maintain your profits, you will probably find that your competition is holding the line, too. His problems are similar to yours. And perhaps he has a cantankerous wife to boot.

You'll get the help you need to establish and maintain a sound pricing policy on the following pages under the Project Upgrade symbol. By making the correct decision for your organization, you will have made the largest possible contribution to your company, your industry, and your own best interests.

Jack Robinson

Is price cutting a problem

DON V. PETRONE, *president, Typhoon Air Conditioning Div., Hupp Corp.*

BUSINESS BACKGROUND:

President of Typhoon since 1953. Started in engineering department, 1935. Worked in sales engineering and export, 1938-41. In 1945, after military service, rejoined Typhoon as sales manager. Became successively vice president of sales, executive vice president, and president. When Typhoon merged with Hupp in 1955, became vice president of sales and a director of Hupp.

INDUSTRY ACTIVITIES:

For several years a director of Air-Conditioning and Refrigeration Institute and chairman of its unitary air-conditioner section; vice president, 1957-58; president, 1958-59. Also has served on several committees of American Society of Heating, Refrigerating and Air-Conditioning Engineers and International Institute of Refrigeration.



IT'S NO SECRET that low price levels have created serious problems at times in the airconditioning industry. Much of this distressingly low pricing has come about because the people responsible grossly miscalculated the possibilities of obtaining high volume to achieve greater burden absorption. Perhaps a little plain talk would be helpful.

There is nothing magic about the airconditioning business. As in any other business, an airconditioning manufacturer, distributor, or contractor-dealer must take in more than he spends if he wants to stay in business.

Yet many people, representing some of the nation's most able manufacturers in other product lines, have seemed bedazzled by illusions about growth of the airconditioning market, and deluded about ways of obtaining this growth. They have seemed to feel it can be done without knowledge of or investment in product and market development. They have seemed to believe that the unreasonable sales volume needed to spread burden costs could be snatched through pricing strategy alone.

This kind of miscalculation about prices and volume often is accompanied by cheapening of product. As a result, during the past several years few airconditioning manufacturers have been able to make a satisfactory profit and still provide satisfactory service.

The story is not all bad, however. The airconditioning industry will see reasonable growth from year to year. But it will be reasonable, not miraculous. It will be based on hard work and careful investment in product and market development, not on playing with price tags.

At the risk of oversimplifying the situation, I would like to offer three cardinal rules which, properly applied, can become cornerstones of a profitable airconditioning business:

1. Build a sound gross profit into your price. Don't try to blame any lack of profit on outside elements.
2. Don't kill your profit by spending more for sales than you take in, or by cutting your prices below the levels required for profitable operation of your business.
3. Stick to accurate sales forecasting. Too often, wild forecasting based on guesswork or wishful thinking rather than historical performance and sober analysis has resulted in overproduction or unwise organizational expansion that eats into profits.

As a safeguard against pricecutting, I urge a return to the sound competitive principles we all know well enough but sometimes fail to practice. Let each of us, keeping his own counsel, analyze potential volume realistically and make his sales forecast accordingly. And let each of us sell at prices which provide a reasonable certainty of profit.

Although I am speaking as a manufacturer, I strongly encourage this approach for distributors and contractor-dealers as well. It's the best business insurance any of us can provide.

n your business?

DANIEL M. BROWN, *vice president, Systems Engineering Corp.*



THE WAY CONTRACTORS GO AFTER BUSINESS often reminds me of the old nursery rhyme about the three blind mice. Remember how they all ran after the farmer's wife, who cut off their tails with a carving knife?

Well, three (or more) blind contractors frequently try to sell the same customer. But in this case the only one who loses his tail is the one who cuts his price to get the job.

We contractors are too often blind to the financial facts of life. Here's the sort of fallacious reasoning that many contractors use in their approach to a prospective sale in relation to the financial side of their business:

"By increasing my sales this year, my percentage overhead will drop. The way I'm set up now, I can double my sales without increasing my overhead. Why shouldn't I cut my price to grab off this big job? Anything I can gross will be just so much gravy."

As any sound businessman will realize, such statements might well come under the heading of "famous last words!"

To open the eyes of these blind contractors, our association (Refrigeration and Air Conditioning Contractors Association) and one or two of the better trade publications persistently try to get across to them these basic facts of business finances:

1. If your working capital is \$X, it is possible for your company to handle no more than \$Y in sales volume.
2. If your sales are already up to the \$Y limit, an overnight doubling of sales to \$2Y will lead you directly to bankruptcy.
3. If you load yourself with \$Y in sales through price cutting, you won't be able to handle the more profitable sales opportunities which inevitably will arise, and which you will need to give you a reasonable gross profit at the end of the year.
4. Do not estimate and price a job with the same optimistic approach you use in selling. You can count on the fact that when buying and installing the job everything will *not* happen for the best. Your cost estimate sheets must include all items in the correct amounts and at the actual prices you will have to pay for them. Then add a contingency reserve to cover the almost inevitable unforeseen problems.
5. If you close a job through salesmanship and better engineering — rather than through a price cut — you will be truly earning your salt as a contractor. The result will be greater income for your company and for yourself.

Alluding again to the nursery rhyme, our blind contractors will regain their vision (and keep their tails) if industry suppliers, publications, and trade associations keep hammering home to them these five basic principles of sound business management.

BUSINESS BACKGROUND:

Vice president, *Systems Engineering Corp.*, Chicago contracting firm, since 1954. Designed heating and airconditioning products at *Armour Research Foundation*. In 1948 joined *Systems Engineering* as sales engineer for heating, ventilating and airconditioning. Moved into management of environmental equipment business. As vice president has been active in both sales and management.

INDUSTRY ACTIVITIES:

Secretary-treasurer, *Refrigeration and Air Conditioning Contractors Association of Chicago*, 1959; president, 1960; reelected president, 1961. Chairman of manufacturer and wholesaler relations committee, *Refrigeration and Air Conditioning Contractors Association (National)*; member, advisory board. Member, *American Society of Heating, Refrigerating and Air Conditioning Engineers*.

Charge what the job

GEORGE C. WEBSTER, consulting editor, business management

PRICE CUTTING is one of our industry's oldest and most vexing problems. It has been with us continually in greater or lesser degree ever since the industry began, except for a few periods of product shortage during World War 2 and the Korean conflict.

The same is true of most other industries, too. The cartoon of the bum sitting on the park bench over the caption "I was the lowest bidder" probably was first drawn on a papyrus scroll by an ancient Egyptian. It has been copied in one form or another ever since commerce between men began.

If the problem of price cutting is so old, why hasn't somebody figured out an answer to it?

Believe it or not, there is an effective answer. It comes in two parts:

- Charge what the job is worth.
- Get your price by convincing the customer that your job is worth the extra money.

I'm not going to be so naive as to tell you that if you follow these two points you'll get every job, and get it at a price that will bring you a fair profit. But I can give you a good example of what can happen if you go along determined to undersell every competitor.

Just recently one of the oldest and largest mechanical contractors in the eastern part of the country, doing a business of more than \$10 million a year, went broke. In a statement to the press he said: "I just took the work too cheaply, figuring on making a 10% gross profit and then robbing Peter to pay Paul."

So it happens with the biggest contractors just as it happens to the smallest ones.

But remember this one very important thing — not all price cutters go broke! The biggest price cutter in the United States, Sears, Roebuck, has been selling at the low dollar for over half a century and is still going strong. They may be cutting prices, but they are still charging what the job is worth.

John Ruskin, the 19th century English author and social reformer, was right when he said: "There is

hardly anything in the world that some men cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey."

Before you start cursing the price cutter and blaming him for all your woes, critically examine your own price structure, appraise your own value story, and see if you are really giving the customer what you are asking him to pay for. If you are, then don't worry about the price cutter. Instead, concentrate all your attention on selling the customer on paying more for your product or your job, and convincing him that he is getting more value for his dollars.

Can you sincerely tell a customer who mentions he has "a lower price" that your job is worth the difference — and more? Can you explain this difference in language he can understand? Can you show him point by point the difference between your job and your competitor's cut-price job?

If you can't, then you'd better start preparing yourself and your organization to meet cut-price competition head on through the 3-step program outlined on these pages. If you really work at this program, if you really do a job with it, you will find that you and your men can go out with a selling story that will put you way ahead of any price cutting competitors.

Not long ago I conducted a program just like this for one of my clients. It resulted in a 32-page selling brochure. Yes, there actually were 32 pages of real sales points this client could use effectively to overcome the price objection.

You may not need or want a 32-page brochure, but in your own way and at your own level you, too, can put together an effective presentation telling why your prospects should buy from *you*. In preparing it, keep these important facts in mind:

- You don't have to be the biggest to be the best. Example: the small contractor can stress personalized service to counteract the large contractor's claim that he has the largest fleet of service trucks.

s worth

- Quality is often intangible, but you must try to demonstrate it or explain it in specific terms that will create a favorable image in your prospect's mind. Example: "all our servicemen have had factory training" means much more than just "we have the best servicemen".

- Stress your satisfied customers. List them. Urge your prospects to contact them about the quality of your work. This will make your prospects confident that they can buy from you with the same assurance of satisfaction that they'll be getting their money's worth.

So you pitch all this at a prospect and he still looks you square in the eye and says, "... but I've got a lower price." What do you do then? *Stick to your price!* Don't back down, because even if this prospect buys from the price cutter he may later buy from you, or at least recommend you to others, after he has discovered what a mistake he has made by being penny wise and pound foolish.

There's no doubt about it. The only practical answer to price cutting is to know that your job is worth the price you ask, and to be able to prove this to the customer. Remember, most buyers are just like you — they want the best deal they can get. And they'll pay the higher price if you can convince them it's the best deal.

...

If you don't believe this, if you think it's just a lot of pleasant platitudes carefully contrived to puff up an idealistic and unworkable theory, turn back to your June issue of THE REFRIGERATION & AIRCONDITIONING BUSINESS and read the featured article, "I tried to buy airconditioning for a store." Here's concrete and carefully documented proof that the contractor who uses good salesmanship of the type described here can lick the price cutter. If you can't find your copy of the June issue, we'll be glad to sell you reprints of that article in any quantity you desire ... but not at a cut price!

HERE'S A CONSTRUCTIVE 3-STEP PROGRAM TO LICK CUT-PRICE COMPETITION

STEP 1

Arrange a series of evening meetings with your salesmen, your servicemen, and any others from your organization who might want to participate in a program that you could call Operation Sell. Plan three or four meetings. Schedule each to last about two hours. Give everyone a chance to participate. Offer prizes for the best ideas submitted on how your company gives more value to the customer than your competitors do.

STEP 2

Pick a theme for each meeting. The first could be Service; the second, Application and Engineering; the third, Product; the fourth, Installation; or any others that you think appropriate. Make it clear to all that the purpose of each meeting is to develop points of difference between the quality you offer and that offered by your competitors. See how many plus factors you can point up in your jobs that your competitors can't match. In your meeting on product you might want to have a representative of your wholesaler attend to give the quality story on the equipment and supplies you buy from him. You may get many effective new selling points this way.

STEP 3

Build the results of these meetings into a solid selling story. If you can, incorporate at least the highlights into a printed folder or brochure that you can give to prospects or include with every proposal. Drill your salesmen on this story over and over, until they have it down pat and can use it on a price-conscious prospect without missing a trick. ♦

Do you cut service prices?

WHY DO SOME CONTRACTORS price their service work so much lower than others?

It may be because they are so hungry for business that they're determined to get the job at any cost. More likely, however, it's because they are ignorant — because they simply don't know their costs, so don't know what price they have to charge in order to make a reasonable profit on the job. If this is the case they are not really price cutters, they're just poor businessmen — but the effect is exactly the same, regardless of why they are doing it.

The contractor who sells his service below cost hurts everybody.

He hurts himself, because he loses money on every deal, whether he realizes it or not.

He hurts his customer, because he doesn't put

enough in his price to make it possible for him to do the right kind of job.

And he hurts his competitors, because every job he takes at a loss is just one more job that nobody has a chance to get at a profit.

To help its members price their service work properly, the Refrigeration and Air Conditioning Contractors Association of Southern California has developed this cost analysis chart to show what one hour of service work actually costs in the Los Angeles area.

Of course labor rates and other costs vary in different parts of the country, so a direct comparison may not be possible. But check your own costs against this breakdown, anyway. By making you itemize every factor in your service costs, it will help you price your work at a profit. ♦

COST ANALYSIS FOR ONE HOUR OF SERVICE WORK

This chart was prepared by the association's service committee, composed of representatives of 10 contractor-members. It is based on actual service costs of these 10 firms during March and April, 1961.

● Hourly wage shown is that of certified union journeymen in Los Angeles county.

● Truck charges are included in this analysis, although most contractors bill them separately to the customer.

● Miscellaneous includes use of items normally stocked on truck but not charged to customer, such as small amounts of welding supplies, rags, thermometers, flashlight bulbs and batteries, oil and grease.

● Direct sales expense is itemized because many contractors have salesmen in the field obtaining service work. In some cases the owner acts as a service salesman, too. This factor varies with the business methods of the contractors.

● Supervision includes all personnel behind the serviceman.

DIRECT COSTS	HOURLY COST	YOUR COST
LABOR		
Hourly wage -- certified journeyman, including fringe benefits	4.93	
Social Security	.07	
Unemployment Insurance (including special assessments)	.06	
Workmen's Compensation	.08	
TRUCK EXPENSE		
Includes depreciation, maintenance and repairs, oil, gas, insurance, garage	.75	
LOST TIME -- call backs, standby		
	.20	
OVERHEAD		
Telephone, utilities	.20	
Rent, or rental value	.07	
Uniforms	.03	
Office supplies	.05	
Auditing, legal	.01	
Advertising	.05	
Office equipment -- depreciation, repairs	.02	
Credit losses	.04	
Insurance -- fire, theft, liability	.03	
Property taxes -- city, county	.02	
Licenses -- city, county, state	.02	
Association dues	.02	
Donations	.02	
Interest on business investment	.12	
Miscellaneous	.15	
Direct sales expense	.20	
TOTAL	7.17	
SUPERVISION (averages 1 non-production worker to 5 journeymen)		
Includes dispatcher, clerical and bookkeeping help, executive salaries	1.25	
TOTAL	8.42	
PROFIT	???	

Wholesaler **ACTIVITIES**

Fixing profits not wholesalers' answer for escaping the price-cost squeeze

"Wholesalers are caught right in the middle of the squeeze between lower prices and higher costs." George C. Webster, business management consultant for THE REFRIGERATION & AIRCONDITIONING BUSINESS, told this to members of Air Conditioning & Refrigeration Wholesalers' Region 5 at their recent meeting.

Webster pointed out that because of this squeeze, he now knows why wholesalers are often referred to as the "middlemen."

"Competition from all sides is threatening gross margin," the consultant said. "Inflationary practices of our government, coupled with the unions, are raising costs. This squeeze has never before been as great as it is today."

"Many firms in our industry will go out of business in the next few years," Webster warned the ARW group. Why?

- Lack of capital for expansion.
- Inability of management to operate a larger business.
- Inadequately trained replacements for the old timers in the business.

"Wholesalers can continue to grow and avoid going out of business by preparing themselves to meet today's existing conditions," said the consultant. "They must become better managers, better planners, and better administrators."

"It may have taken only a small amount of money and technical know-how to get *into* this business, but it is going to take a lot of management know-how to *stay* in it."

What causes the squeeze?

Pressure for lower prices comes from the top, the speaker emphasized. "It's the pressure of increased

volume with a lower mark up. The basis for this theory is that most costs are fixed and anything priced above them adds something to overhead.



GEORGE C. WEBSTER

"To engage in the practice of price cutting, you must make sure that your fixed costs are adequately covered by other transactions bringing in sufficient gross profit."

"It's becoming more difficult to make money by price cutting," warned Webster. "This is because of the increased number of competitors. You must know if you are in a position to compete for this tempting volume and still maintain profit."

"As long as there is business, the gross profit squeeze from the top will always be with us. So you may as well forget the idea of looking for ways to fix profits," explained Webster.

"Your solution to this squeeze is going to come from intelligent management planning guided by factual assistance from your association. It's in your costs of doing business," Webster told the ARW members.

He explained that in the past few years of fast sales growth every mistake and every inefficiency has

been absorbed by expanded growth profit. "But this can't continue — the growth rate must slow down as it does at some point for every company. It may even stop growing for awhile, or decline," Webster warned the group.

What will happen to expenses then? Webster says they will continue to rise because:

- (1) No one has bothered to control them before;
- (2) We may not know our volume is off or our growth rate is down;
- (3) We've never had to cut expenses or fire people and therefore don't know how;
- (4) We don't have any idea that our expenses are out of line;
- (5) We don't have the information to know where to cut expenses;
- (6) We think the situation is temporary.

"During the next five years things are going to move swiftly for you and it's not all going to be pleasant," the speaker prophesied. "It will be difficult to ward off the inevitable profit squeeze, but you must prevent it from squeezing your profits dry."

"Assisted by your truly professional association, you must become professional managers, making decisions on the basis of the best facts available to you."

"You will have to plan growth; plan selection of lines; plan gross margins; and plan your marketing approach." ♦

Up grade
PROJECT

What type of airconditioning is best for commercial buildings?

LET'S FACE IT. The type of airconditioning you sell and install for commercial applications such as hotels, motels, apartments, and office buildings will depend in the final analysis upon what you have available in the makes of equipment you handle.

It's easy to point to successful applications of both self-contained room airconditioners and central station fan-coil systems. It would be no problem at all to round up long lists of satisfied customers using each

But there are certain definite advantages to each type of system. To get the lowdown on what they are, I went to New York City to talk to two experts: an outspoken advocate of year-round thru-the-wall room units and a staunch supporter of remote fan-coil systems. What they told me is reported on these pages.

JIM McCALLUM, *editor*

"... remote fan-coil"

DAN CHYTALO CAN GIVE YOU a list of reasons as long as your arm why central plant airconditioning is the best buy for apartments, hotels, motels, and office buildings. These reasons are based on his 14 years of experience in engineering and selling such systems in the New York City area.

Chytalo is manager of owner-builder sales in the New York district for Trane Co. Previously he served as engineering and sales consultant for Jarcho Bros., Inc., a Long Island City contractor. So he has evaluated commercial airconditioning installations from both the manufacturer's and the contractor's side of the fence.

Here are the most important advantages of the remote fan-coil system as he sees them:

Flexibility of equipment. You can get fan-coil units in sizes ranging from 200 to 600 cfm, designed to introduce up to 25% ventilation air. The more chilled or heated water you pump through them, the greater the coil capacity. So it's easy to meet the different load and ventilation requirements of each conditioned area.

Close control of temperature and humidity. A fan-coil system with provision for wall intake of ventilation air provides excellent year-round temperature control by varying water flow through the coil or adjusting fan speed. The ventilation feature can be used for cooling during in-between seasons when outside temperature is below room temperature. On cool but humid days, the fan-coil can be used for dehumidifying, without sacrificing temperature control, by operating the fan at medium or low speed with the water control valve wide open.

Ability to cool instantly. When a fan-coil unit is turned on, it immediately begins its cooling action. The coil surface is at a proper temperature for immediate response, providing the water valve has been left partially open.

Architecturally attractive. The wall intake for a fan-coil requires only a small opening, generally no more than two bricks high by two bricks wide, which does not detract from the exterior appearance of the building. In fact, the architect can disguise these openings by incorporating them into window sill design.

Year-round ventilation. The central plant fan-coil system with wall intake or separate ventilation system provides year-round ventilation engineered to meet individual room requirements. This ventilation air is conditioned and filtered.

systems offer the most for the money"

No winter infiltration. A properly designed fan-coil unit is furnished with a gasket which acts as a seal between the unit and the outside air intake in the wall. Proper preparation of the masonry behind the fan-coil unit also helps insure against air leakage. A block-off device between the floor of the unit and the filter prevents outside air from bypassing the unit. High wind velocity will force outside air through the unit, but it will be filtered and heated before being discharged into the room.

Low noise level. Refrigeration plant and pumping equipment are located in uninhabited parts of the building where noise is no problem. Only operating equipment in the conditioned area is the fan and fan motor.

Ease of maintenance. Fan-coil unit needs only seasonal changes of filter and lubrication of fan motor. In most units, one man can do this in 10 minutes or less. You can replace controls quickly if necessary. You can service the refrigeration machine, pump, and cooling tower without disturbing occupants.

Long life expectancy. Equipment is designed and built for long life. Because it is readily accessible it's apt to get serviced more frequently. Equipment that is cared for regularly lasts longer. None of equipment is exposed to weather. Moisture condensed during cooling cycle is not corrosive. Gages and indicating lights warn of trouble with refrigerating equipment; protective control devices shut it off if anything goes wrong.

Low installed kw requirements. In a typical 500-room apartment building having 150 living rooms, 200 bedrooms, and 150 kitchens, with only living rooms and bedrooms airconditioned, kw requirements for a central plant fan-coil system would be 39.35 kw for fan-coil units and 255 for refrigeration cycle, for a total of 294.35 kw. Total kw requirements for thru-the-wall self-contained units to handle this same installation would be 490 kw.

Low operating costs. The comparative kw requirements definitely indicate a lower operating cost for the central plant fan-coil system. In apartments there's another cost factor to consider. Usually tenants are metered separately from the building meter. Since they consume relatively small amounts of electrical energy, they are billed at a correspondingly high rate. In the example cited, with a fan-coil system tenants

would pay only for the 39.35 kw consumed in the fan motors. The other 255 kw would be charged to the building owner at a substantially lower rate. The owner could then allocate this lower rate among tenants in the rental structure. With self-contained room airconditioners, tenants would pay the full cost of the 490 kw at a higher rate. If the building is centrally metered and the rental structure includes utilities this kw comparison is of prime importance to the building owner, since the difference between the cost of the 294.35 kw and the 490 kw operation either comes out of his pocket or results in higher rents.

Low overall costs. In the apartment building example cited, first cost of thru-the-wall room airconditioners would be considerably lower than that of a fan-coil system. But this is not always a true index of the economics of two airconditioning systems. The following analysis shows *total costs* (including owning, operating, and maintenance) of a central station fan-coil system for this 500-room apartment building, based on a 25-year period:

FIRST COST (FC) OF SYSTEM	\$220,000
ANNUAL FIXED CHARGES	
Y = 25 years i = 6% interest rate	
Amortization & depreciation $FC \div Y$	\$8,800
Interest $(Y - 1) \div 2Y \times i \times FC$	6,340
Misc. items (fees, taxes, etc.)	2,000
Total annual fixed charges	\$17,140
ANNUAL MAINTENANCE COSTS	
Replacement of parts including labor	\$2,800
Replacement of valves, piping	700
Replacement of filters	700
Water treatment	300
Labor for maintenance & operation	5,000
Total annual maintenance costs	\$9,500
ANNUAL OPERATING COSTS	
Heating	\$14,000
Electric or central steam, including electric for auxiliary equipment	8,200
Water used	300
Total annual operating costs	\$22,500
TOTAL OWNING, OPERATING AND MAINTENANCE COSTS	\$49,140

**For the arguments in favor
of self-contained room units,
turn the page**

"... thru-the-wall room units give me more profit, less grief"

TALK TO "HAM" HAMILTON for 10 minutes about thru-the-wall room airconditioners and you'll be convinced they're the finest thing that ever came down the pike for providing year-round comfort in commercial buildings such as apartments, hotels, motels, and offices.

Hamilton (whose initials are H.B.) is vice president of S. J. O'Brien Companies, a New York City contractor. He talks with the enthusiasm of an evangelist when he discusses his firm's installations of American-Standard "Remotaire" units. But he freely admits to being somewhat biased, since he has worked closely with that company in the development of this line of equipment.

I asked him point-blank, "Just why are you so hopped up on this particular type of airconditioning?"

His answer was equally direct: "I like to handle a product I can sell at a reasonable profit, and that will cause me the fewest possible service headaches."

Hamilton speaks from experience, not theory, on both points. His firm has installed more than 7000 of these units in the past five years, and already has firm orders for 1000 more in 1962.

"And for the most part," he told me, "we've been able to just install them and forget them. The thru-the-wall installation gives them great stability. The fact that they are permanently leveled and virtually free from vibration contributes to a long and trouble-free life."

Units show up best in existing buildings

Each Remotaire unit houses a self-contained air-cooled refrigeration circuit and is available with integral heating arrangements for steam, hot water, or electricity. This makes for flexibility in performance, Hamilton pointed out, which is especially helpful in the in-between seasons. Individual control makes it possible for one unit to be cooling while the unit in the next room is heating.

Use of room units eliminates the need for a central cooling plant and the attendant requirement of a licensed operating engineer. And in the event of a mechanical failure only one room is affected, not the entire building.

Year-round thru-the-wall units can be — and often are — figured in the design of new construction. In fact, the O'Brien firm is installing this type of equip-

ment in a plush New Jersey motel now being built. But Hamilton feels that their competitive advantages show up more strikingly in existing buildings. Here's why:

- Units can be installed quickly, without dislodging or seriously inconveniencing occupants.

- Cooling can be provided room by room as required; an entire building can be cooled on a piece-meal basis if desirable.

Hamilton told me about several jobs that demonstrated the speed and ease with which thru-the-wall room units can be installed. If time is a factor, O'Brien can put in as many as 15 units a day.

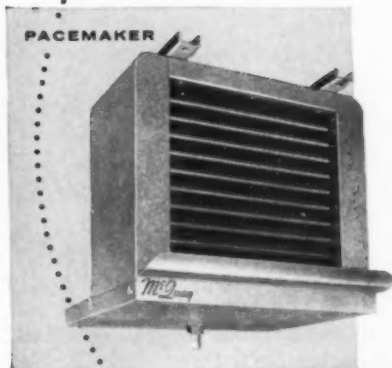
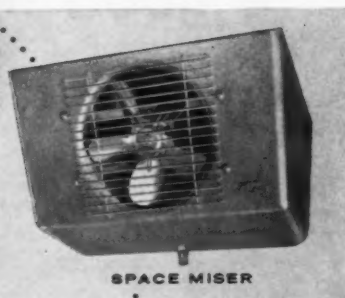
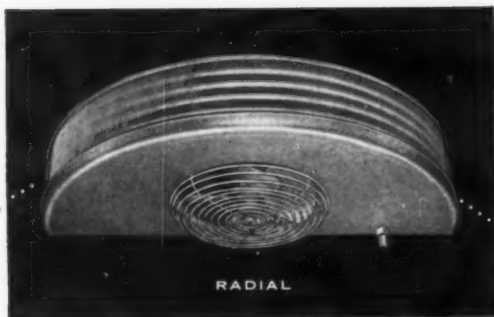
He described one \$300,000 hotel job in which 525 rooms were airconditioned this way in just 2½ months, and without any loss of rental revenue. Each day, installation crews moved in after the rooms were vacated. The rooms were returned to management by 4:30 p.m. for rental that night. This sort of a schedule requires close cooperation between the crews cutting the wall openings and the crews installing the room units.

Management budgets airconditioning costs

Many commercial buildings, Hamilton pointed out, simply can't afford the financial burden of doing a complete airconditioning job all at one time, as is required with central station systems. He cited the case of one hotel that budgeted a 1000-room installation over a 4-year period by conditioning 250 rooms a year. Total cost of this job was \$900,000. The competing bid for a high-pressure central station system was half again as much, and the job would have had to be done all at once.

"When you use thru-the-wall units for perimeter rooms," I asked him, "what do you do about interior areas, such as lobbies and corridors in apartment buildings and public rooms in hotels?"

"Simple," he said. "We aircondition them with standard commercial package units. This makes it easy for us to match the cooling for each area to its particular requirements. This generally results in operating costs lower than could be provided with central station equipment, since no unit is operating unless the area it serves is calling for cooling." ♦



THE *McQuay* REFRIGERATION LINE IS COMPLETE

an outstanding unit for
every requirement

Whatever your refrigeration requirements may be, you will find a McQuay unit to exactly meet your needs. And, every unit is tops in its field due to McQuay's incomparable manufacturing and engineering know-how, coupled, of course, with the famous McQuay Ripple-Fin coils for highest performance and efficiency. In addition to the unit coolers shown here, the McQuay line includes electric and hot gas defrost systems, gravity coils, product freezers and product coolers, residential evaporators, fan coil units, large capacity air conditioners and the popular Aircon air cooled condensers. All are available in the widest possible range of sizes and capacities, and are very favorably priced for quality products. For complete information, see your refrigeration wholesaler, or write McQuay, Inc., 1643 Broadway N. E., Minneapolis 13, Minnesota.



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circle 39 on reader service card

How to get a good insulation job for your customer

RON HENRY, *associate editor*

COMMERCIAL REFRIGERATION INSTALLATIONS are no better than the combined efforts of the refrigeration and insulation contractors can make them. Both contractors have to pool their skills to make a commercial refrigeration job work correctly.

The relationship usually is based on trust. Without trust, the installation might become a fiasco, bringing ridicule and notoriety to each contractor.

I talked to refrigeration and to insulation contractors to find how they bridged the gap between each other. Was it by a quick phone call from ABC Refrigeration to XYZ Insulation? No, they told me. Each group has its own contacts in the other group.

These contracts are based on the mutual understanding that each contractor will do his best to make each installation a credit to both. Neither side believes for one minute that the other man is specifying something merely to build his own profits.

One insulation contractor told me: "We get calls from the same refrigeration contractors because we have developed a close relationship of trust over the years. He knows that if he tells me about a job, I won't tell anyone else about it. I know from experience that the more people that know about a job, the less chance I have of getting it."

Who starts the ball rolling on an insulation job?

I found that most often it is the owner of the building. He calls either a refrigeration contractor, an insulation contractor, or an architect. What parts, then, do these three men play in drawing up specifications for equipment and materials?

The refrigeration contractor would consult an insulation contractor. Between them, they would draw up plans and specifications for the correct blend of refrigeration equipment and insulation materials to do the required job.

The insulation contractor would draw up preliminary plans after consulting with a refrigeration con-

tractor, then give plans to an architect for final drawings.

The architect would consult an insulation contractor, who would draw up preliminary plans. Or the architect would specify everything by consulting various catalogs.

What if the building owner has his own ideas on insulation, based either on past experience or plain whimsey?

"A man who had cork installed in his place 20 years ago is likely to ask for it again," one insulation man told me. "I've got two choices in this case. Either go ahead and install cork or tell the owner of the many changes in materials and installation methods since he last built a cold storage warehouse or installed a freezer or cooler. If he still insists on cork, that's what he gets. Owners often are willing to try a newer insulation, say plastics, if they can see the advantages in using it."

I found most insulation contractors will go along with an owner's wishes if they are based on experience and are reasonable. "There's no set answer for every insulation installation," I was told.

"Ten insulation contractors can relate as many different experiences with similar materials in like situations. There are certain things that everyone knows won't work and we all stay away from those. Since each installation has its built-in set of conditions, we all have to rely on each other to benefit from our combined experiences."

What happens when the architect specifies the type and quantity of insulation?

Here's what contractors told me: "Most architects have learned through experience that the only safe way to specify is to consult one of us first. If not, specifications taken directly from a catalog can be completely off base."

TELL YOUR INSULATION CONTRACTOR . . .

- ✓ What is the size of the installation?
- ✓ What is the desired operating temperature?
- ✓ Is installation located inside the building or is it on an outside wall?
- ✓ What is the condition of the area surrounding the installation?
- ✓ What is to be stored?
- ✓ How long will it be stored?
- ✓ What will be the maximum weight of the product to be stored?
- ✓ What is to be processed?
- ✓ What type of traffic will there be in the installation? Foot? Hand carts? Fork trucks?
- ✓ What is the peak load of refrigeration? How long will it last?
- ✓ What adhesives are to be used?
- ✓ Is there adequate insulation provided for future lower temperatures?
- ✓ Is floor to be insulated?
- ✓ Is freezer floor to be ventilated?
- ✓ Are doors large enough to accommodate products?
- ✓ Is crawl space above ceiling to be ventilated?

"However, not all architects consult before they specify. If their specifications seem incongruous, I'll try to talk the architect into some changes. If he won't change his specifications, I state my disagreement in writing, saying I'll not be liable for the job if it is installed accordingly.

"Often I'll turn down the job rather than take it and risk my reputation. I've found that sometimes I

can get through to the architect by complaining to the general contractor.

"I represent a major manufacturer of insulation. If I object to specifications, often the building owner will intercede for me. He realizes that if someone as close to the product as I am objects, something is wrong."

The main point insulation contractors impressed upon me was the need for consultation with the refrigeration contractor in planning an installation. "Rooms must be refrigerated to suit the insulation," I was told. "In insulating a warehouse, cooler, freezer, processing room, or what-have-you, there must be adequate planning for future insulation needs."

What must a refrigeration contractor know about a low-temperature job before he brings the insulation contractor into the picture?

Look at the checklist on these pages. Not every installation will include all of these considerations, but none can be overlooked. It's the responsibility of the refrigeration contractor to get all the information together before consulting with an insulation contractor.

What are some other considerations?

One common difficulty in freezer rooms is control of sub-floor freezing. There are two ways to do it. The easiest is to plan ahead by ventilating the sub-floor adequately before construction. The hard way is to control freezing by using heater cables. And it is expensive, too.

Another trouble spot comes when a low-temperature installation is started for the first time. Steps must be taken to reduce thermal shock, since materials used to construct refrigerated rooms, like all other materials, are affected by large, rapid temperature changes.

Let's say a room has been insulated and refrigerated to maintain an operating temperature of -20 F. One insulation manufacturer has recommended a rate for reducing temperature slowly over a set period of days. This manufacturer has set up a maximum allowable rate and a recommended rate.

The **maximum rate** is 20 degrees for each 24-hour day to 35 F; decreasing 5 degrees one day to 30 F, then a maximum of 15 degrees daily to the desired operating temperature.

The **recommended rate** is a maximum of 15 degrees daily to 35 F; a drop of 5 degrees in one day to 30 F, then a maximum of 10 degrees a day to reach the desired temperature. ♦

TV station uses half mile of prefab duct



INSTALLING THE DUCTWORK is fast and simple. Here a workman wraps tape around the ducts where they join above the suspended ceiling in one room of the remodeled TV station.

A KNIFE AND A SCREWDRIVER were just about all the tools needed to install 2500' — almost half a mile — of prefabricated ductwork in the rerouting and addition of airconditioning at Cleveland television station KYW. The knife cut the sections of duct, the screwdriver helped hold them in place.

The \$75,000 job was threefold:

- Install three air distribution systems
- Reroute an existing system
- Deadend all sounds for televising

The airconditioning problem arose when KYW moved into three floors of an old existing office building. The building had a \$400,000 airconditioning installation only five years old. But the new cooling systems were needed to service the station's radio facilities, television studios, and general offices.

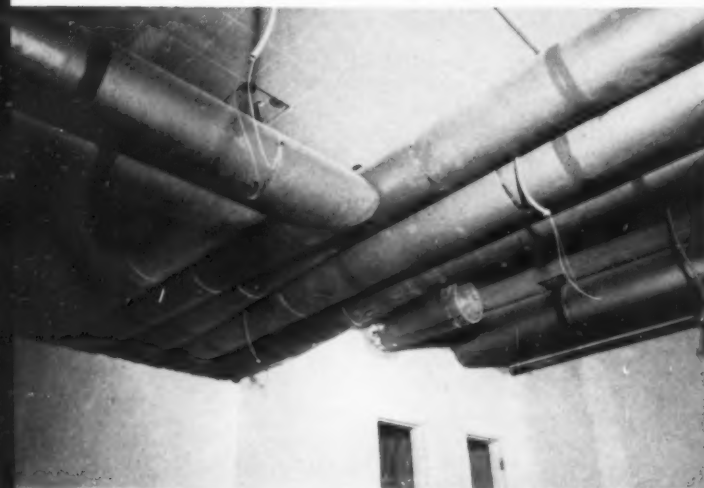
Rerouting old and adding new ductwork was the biggest headache. But use of 5' lengths of round, prefabricated glass fiber duct made the installation fast and simple.

Acoustic felt $\frac{1}{2}$ " thick lines the ducts where they join air handlers. The lengths are joined by fittings and by tape and are cut at 45-degree angles to fit around corners. Each piece of duct fits snugly over a 26-gage galvanized sheet metal converter 12" long to make joint connections rigid and smooth. Toggle bolts screwed into the ceiling hold metal straps which wrap around the ducts to hold them in place and out of sight in the suspended ceiling.

The contractor, A. D. Morton Co., Inc., Cleveland, had to reroute the existing system because room outlets were changed when all rooms were relocated in the \$1 million remodeling job. Gustin-Bacon "G-B" ductwork varying in size from 6 to 18" dia. was used in both the old and the new air systems although some of the existing square metal ducts could be utilized.

To obtain proper sound conditions, there's an 8" air space between the studios' double concrete walls and control room windows consist of two sheets of glass $\frac{3}{8}$ " and $\frac{1}{4}$ " thick to cut down harmonized vibration. Heavily-gasketed door jams and frames mute room-to-room sounds and door closings.

One air handling unit serves 10 zones on the third floor, one cools the first floor, and the third cools another 10 zones on both the first and second floors. Each 7½-hp air handling unit distributes conditioned air at 11,200 cfm. The ducts serve a film editing room, two studios, the lobby, two announcing booths, two control rooms, and a storage room on the first floor. On the second floor the ductwork helps cool offices for clients, directors, and artists. Another film editing room, newsroom, announcing booths, control rooms, and other studios are conditioned on the third floor. ♦



ONLY A SMALL PORTION of the 2500' of ductwork that was installed in the remodelling job is shown in this photo.

HOW TO INSULATE PIPES EASILY AND QUICKLY

Big advantages of preformed insulation

For new pipe lines and those already installed, preformed insulation offers valuable advantages. The most important are ease of installation and saving in labor. It can be applied in as little as half the time required for other types of pipe insulation. And it offers the added benefit of a smooth, finished appearance when applied.

Characteristics of VascoCel Insulation

Made of soft, highly resilient Neoprene, preformed VascoCel offers the surest, easiest way to stop condensation and sweating of air-conditioning and refrigeration equipment lines. Its light weight and flexibility make it unusually easy to handle and to apply.

Moisture-Proof—Its closed cellular structure provides an excellent barrier against moisture.

Insulates—It provides thermal insulation at temperatures from 0 to 220°F.

Nonabsorbent—An immersion test revealed absorption of only 7% by weight in 15 days! And its resistance to air penetration is 100% effective.

Durable—The resistance of VascoCel to penetration by air and water means unusually long service life—cuts maintenance costs on equipment.

Resists Oils, Ozone, Acids, Alkalis, Solvents—All have little effect on VascoCel, other than causing it to swell slightly.

Safe—It is self-flame-extinguishing and therefore incapable of conducting a flame, as from room to room.

VASCOCEL [®]	
SPECIFICATIONS	
Wall Thicknesses	1/8 in., 1/4 in., 3/8 in.
Density	7.88 lb. per cu. ft.
K factor* (120°F)	0.30
Flammability	Self-flame-extinguishing
Average Water Absorption	7.21% weight gain
Average Air Transmission	0.00014 cu ft/hr/sq ft
Average Water Vapor Transmission	0.0583 perm† at 80°F ambient and 75% relative humidity

*K Factor: Heat conductivity expressed in Btu/in. of material thickness/sq ft/°F difference/hr.

†Perm: A measure of vapor conductivity of 1/2 in. wall VascoCel expressed as grains of moisture/sq ft/hr/in. of mercury pressure difference.

Quick easy installation

For new tubing—VascoCel slides over new tubing or pipe like a sleeve. Fits snugly, even on bends up to 45°. For sharper angles it can be cut in a miter box and fitted onto the pipe. Sealing with VascoCel Adhesive produces a permanent, air and moisture-tight joint.

For installed tubing—Slit VascoCel lengthwise with a sharp knife or razor blade. Slip over and around the tubing and seal with adhesive.

NOTE: When applying the adhesive always wait until the adhesive is nontacky to the touch before making the seal.

HOW TO MAKE FITTINGS

Tools you need

- A miter box
- Suitable cutting blade (saw-edged bread-knife)
- Single-edge razor blade for slitting insulation
- Special adhesive (VascoCel Adhesive is recommended)
- Adhesive applicator (brush or slim piece of springy metal)

When cutting the insulation in the miter box, move the blade back and forth, letting the teeth do the work. Do not press heavily. This deforms the tubing and can cause an inaccurate cut.

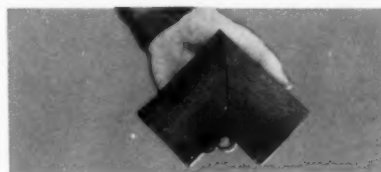
The Tee

Cut 3 pieces of tubing. One takes a single 45° miter box cut. The other two require a double 45° cut each. Apply special cement to cross sections where they have been cut and fit together as shown in Fig. 1. Spread adhesive in a thin, even coating, covering all edges thoroughly. Allow to dry (nontacky to touch) before joining sections.



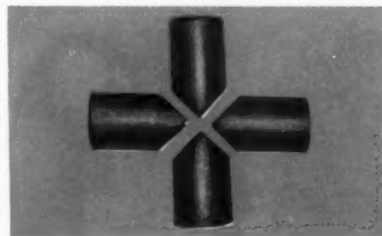
The Elbow

To make an elbow, use two sections, each with a single 45° cut. Apply adhesive and press firmly together, as in Fig. 2.



The Cross

Prepare four sections, each double-cut and join with adhesive as shown in Fig. 3.



See back page for full line of refrigeration products ▶

**FOR TROUBLE-FREE
MAINTENANCE USE**

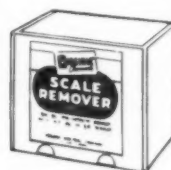
"VIRGINIA" REFRIGERATION PRODUCTS



"Virginia" Scale & Corrosion Inhibitor
Reduces scale buildup sharply, keeping scale-forming solids in suspension or solution. Less scale, less labor, lower maintenance costs.



"Virginia" Liquid Scale Remover
Ideal for heavy scale. Dissolves 3 lb. of scale per gal. Works fast. Inhibited to prevent metal damage. (Anti-foam agent and test papers included with every container.) Light shatterproof throwaway container for easy handling and easy pouring.



"Virginia" Solid Scale Remover
Highly inhibited—safe for use on galvanized, dipped zinc and aluminum water-cooled equipment. Destroys algal growth. Contains 96% sulfamic acid.



"Virginia" Algae-Cides
Adaptable to the special use requirements in (1) towers, (2) evaps, (3) air washers, and (4) ice machines and drip pans. A new No. 4 high-potency formula kills the tough resistant types of algae.

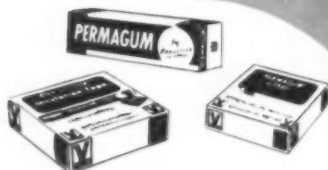


Du Pont FREON® Refrigerants
Nonflammable, nontoxic, stable, odorless. Best known for premium quality. Most widely used refrigerants in the industry. "Virginia" is the only national sales agent for Du Pont "Freon". F-11,* F-12,* F-13,* F-22,* F-113* and F-114* are available in cylinders of all popular sizes.

* Du Pont registered trade mark



"Virginia" Ice Machine Cleaner
Eliminates slow freezing, bad taste and odor. Will not injure enamel or polished metal surfaces. Highly effective on automatic cube or flake ice machines.



Permagum Insulation
Tape—ideal for stopping pipe drip. Adheres to any dry surface. *Permagum slugs*—seals seams, copper tube, BX and conduit entries against moisture. *Cords*—nonstaining, odorless, shaped for use on display cases, freezers, room coolers, etc.



VascoCel Insulation
Preformed of soft, durable, clean, odorless Neoprene. Cuts time and labor costs sharply. Closed-cell structure makes condensation impossible. Ozone, oil, acid, and fungus resistant. Application temperature range 0-220°F. Available in 3/4", 1/2" and 3/8" wall thickness.



"Virginia" Degreasing Solvent
No. 10 has low toxicity, is noncorrosive and fast drying. High flashpoint of 154-160°F reduces fire hazard; dielectric strength 20,000 volts. Ask about "Virginia" "Freon 11" Cleaning Solvent for motor burnouts.



"Suniso" Refrigeration Oils
G Oils are improved for greater stability and lower waxing point. Available in 3G-150 SSU, 4G-300 SSU, and 5G-500 SSU. Dual Inhibited oils have same low wax point, resist breakdown and copper-plating even more effectively.



Can-O-Gas® Packaged Refrigerants
Throwaway cans—full line in screw-top or clip-top cans. Wide variety of preweighed charges, accurate to ±4 grams. Selection of Freon® gases, sulfur dioxide, and methyl chloride.

Carried by wholesalers everywhere. Order from one nearest you or contact Refrigeration Division, VIRGINIA SMELTING COMPANY, West Norfolk, Va.

Available in Canada and many other countries

"Virginia" is the only national sales agent and authorized repacker for Du Pont's "Freon" Refrigerants.

Applications MANUAL

HUGH C. SMITH, consulting editor, refrigeration

Three ways to handle air-cooled condenser jobs in supermarkets

IF YOU'RE INSTALLING supermarket refrigeration jobs using air-cooled condensers, you can offer the market operator a wide choice of equipment arrangements, either remote or self-contained.

Three such systems are in common use today:

1 — Self-contained air-cooled condensing units (compressor and condenser combined), installed in a mechanically ventilated compressor room.

2 — A remote air-cooled condenser equipped with squirrel cage fans, installed inside compressor room.

3 — A remote air-cooled condenser of propeller fan type installed outside and protected by cold weather controls.

System 1 (see Fig. 1) is extremely simple in operation. Air is drawn through a fresh air intake controlled by motorized dampers and is exhausted through the roof of the compressor room by one or more exhaust fans.

The compressor room is usually set up as an annex to the store building. You can use one, two or three

exhaust fans, controlling them in progression by cooling thermostats. If you use only one fan you must equip it with a two-speed motor to help in control of compressor room temperature, which should not fall below 65-70 F.

If you use three fans, set one to cut in at 70 F, the second at 75 F, and the third at 85 F.

In warm climates it is possible to operate a compressor room without any mechanical ventilation by utilizing a roofed and screened enclosure.

Select exhaust fans on the basis of 1000-1100 cfm per horsepower of installed condensing units. Air velocity through the dampers should be a minimum of 600 fpm. To figure the proper area of the damper opening, use this simple equation:

$$\frac{\text{cfm}}{\text{fpm}} = \text{total sq.ft. of damper area}$$

EXAMPLE: a compressor room with air-cooled condensing units totaling 30 hp.

$$\begin{aligned} 30 \text{ hp} \times 1000 \text{ cfm} &= 30,000 \text{ cfm exhaust air} \\ \frac{30,000}{600} &= 50 \text{ sq.ft. damper area} \end{aligned}$$

You should use at least three motorized dampers (A, B and C in Fig. 1) on the air inlet side of the supply air plenum. Control these dampers with modulating thermostats, providing for extremely close step control. The supply air plenum should be at least 3' wide to allow for even air distribution over all condensers. Control dampers A and C so that they are the first to close. Thus in extremely cold weather damper B will be the only one in use and will provide even air distribution to all condensers, as it is located opposite the middle of the lineup.

This damper motor setup, while not particularly complicated from an engineer's standpoint, may present some problems to a refrigeration man not familiar with this type of equipment. The control during sub-zero weather is definitely critical. The compressor room should not be open to the store, as it would create a negative pressure in the store area during cold weather operation.

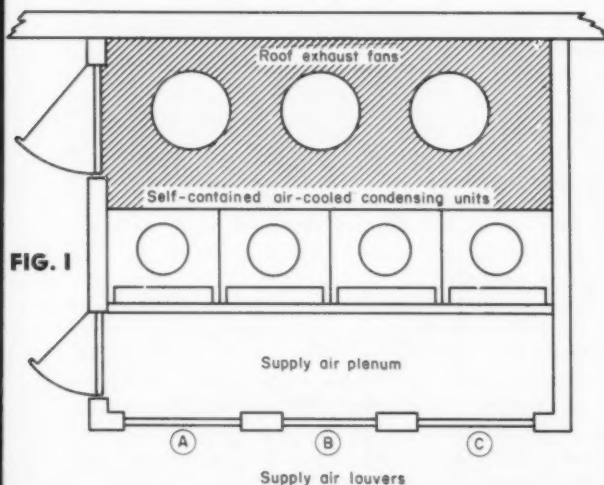


FIG. 1

Continued on page 54

System 2 (see Fig. 2) involves the use of a remote multi-circuit condenser with squirrel cage fan. The condenser usually is suspended from the ceiling of the compressor room and located so that ductwork can be connected to it easily. You can hook up this system in several different ways.

If the store is not airconditioned, you can use the condenser as a ventilating fan by installing an intake grille in the wall between the store and the compressor room. Then, if a door is left open at the far end of the store, the condenser will pull outside air through both the store and the compressor room and discharge it to the outside.

If the store is airconditioned, you can install an intake grille in the wall at one end of the compressor room and run a duct from the discharge side of the condenser to a discharge grille in the opposite wall. Thus in summer the condenser draws air from the outside and discharges it to the outside, ventilating the compressor room in the process. If there is a crawl space between the ceiling and the roof, you can use the condenser to ventilate it and drastically reduce the airconditioning load on the store.

In either of these arrangements, you would have to damper the intake grilles to provide for the necessary conversion from summer to winter operation.

In winter, condensing heat of 400,000 to 500,000 Btu is available for heating the store. In the northern part of the country, the average supermarket of 16,000 sq.ft. requires about 1 million Btu of heat. With this system, you can readily utilize the heat rejected by the condenser to offset a large part of the store's heating load.

Provide an air intake from the store into the compressor room. Then discharge the condenser heat directly into the store area through any system of ductwork and controls you want to provide. If you use this arrangement, you'd better provide for

filtering the air by installing a filter on the intake side of the condenser. Many store owners will demand this precaution.

You can easily compute the amount of heat available from the condenser. Add the total tonnage of refrigeration installed at 20 F suction temperature and multiply this figure by 1.5. Then add the total tonnage of low temperature refrigeration (-10 F to -30 F suction) and multiply this total by 1.6.

EXAMPLE:

$$\begin{array}{rcl} 24 \text{ tons @ } 20 \text{ F suction} & & \\ 5 \text{ tons @ } -20 \text{ F suction} & & \\ 24 \times 1.5 = 36 \text{ tons} & & \\ 5 \times 1.6 = 8 \text{ tons} & & \\ \hline & 44 \text{ tons total} & \end{array}$$

$$44 \text{ tons} \times 12,000 \text{ Btu per ton} = 528,000 \text{ Btu total heat}$$

You can use this method of supplementary heat with any type of heating system. It would go nicely with a hot water radiant installation, installed around the perimeter of the building. Or, you could couple it with another hot air installation without any unusual engineering problems.

Advantages of this system are readily apparent. You can make full use of the heat of rejection, which in this example is approximately one-half of the total heating capacity needed in the average supermarket in the northern states. Cost of utilizing this heat (ductwork and controls only) is much less than the cost of installing a 500,000-Btu furnace.

No special cold weather controls are required on the condenser, as the compressor room is always maintained at 65-70 F. This saving is offset somewhat by the greater cost of the squirrel cage fan type of air-cooled condenser. But on a new store that could be planned for this type of system you should seriously explore its possibilities.

System 3 involves the use of a remote propeller fan type condenser installed outside and equipped with cold weather control. At present it probably is enjoying greater popularity than the other two.

It is important to locate the remote condenser as close as possible to the compressors. A supermarket may use as many as 16 to 20 compressors. Each must have its own individual circuit in the remote air-cooled condenser. Also, each circuit must be provided with a device to limit condenser surface, and thereby condenser capacity, in cold weather.

Install receivers in the compressor room, which should be maintained at 65-70 F.

This system has the advantage of being easily controlled. Since no ductwork is involved, the entire system can be installed readily by any competent refrigeration mechanic. It may not be any cheaper than the other two systems because of the large amount of copper piping involved and the extra refrigerant charge needed for operation of the cold weather control.

There is no convenient rule of thumb you can use to tell just which of these three systems of air-cooled condensers you should use for any particular supermarket installation. Operating factors in various parts of the country differ enough so that each system must be evaluated in terms of the area in which it is to be used. But this analysis should help you in arriving at the proper decision. ♦

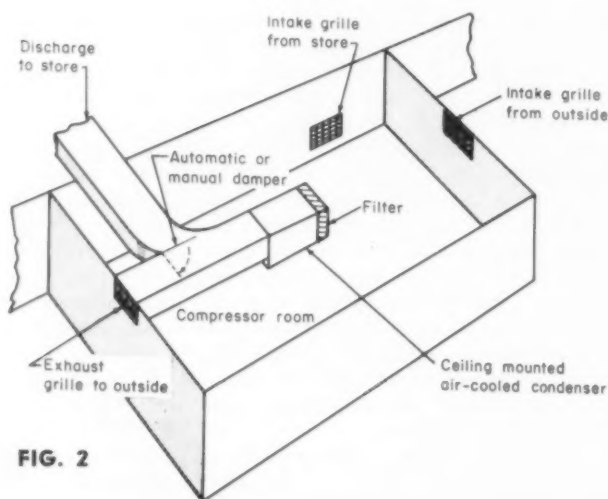
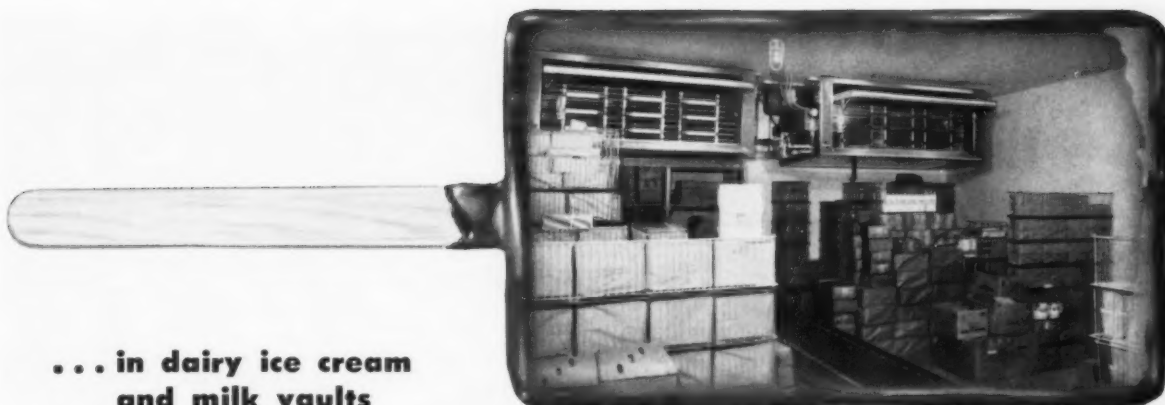


FIG. 2



... in dairy ice cream
and milk vaults

NO FROST... NO ICICLES... NO DRIP

with **KRACK** automatic
Electric Defrost Coolers

Krack Coolers cut maintenance costs 40-50% by...

... preventing ice from falling on floor, products. Patented automatic electric defrosting eliminates man hours needed for manual defrost ... keeps products clean and salable.

... eliminating ceiling frost. Door automatically shuts during defrost cycle so all heat is utilized inside unit. Heat doesn't escape into room to raise temperature, or form ice and frost on ceiling.

... easy and quick installation. Coolers and push-button control cabinets are wired at factory. Available in any size for the dairy industry.

... saving costly storage space. Units are compact and ceiling mounted.

Over 20 years' experience in electric defrosting using production line facilities makes it possible to give you superior value at a moderate price.

Standard production line models, at less cost, deliver full rated capacities in hundreds of dairy and ice cream vaults throughout the United States.

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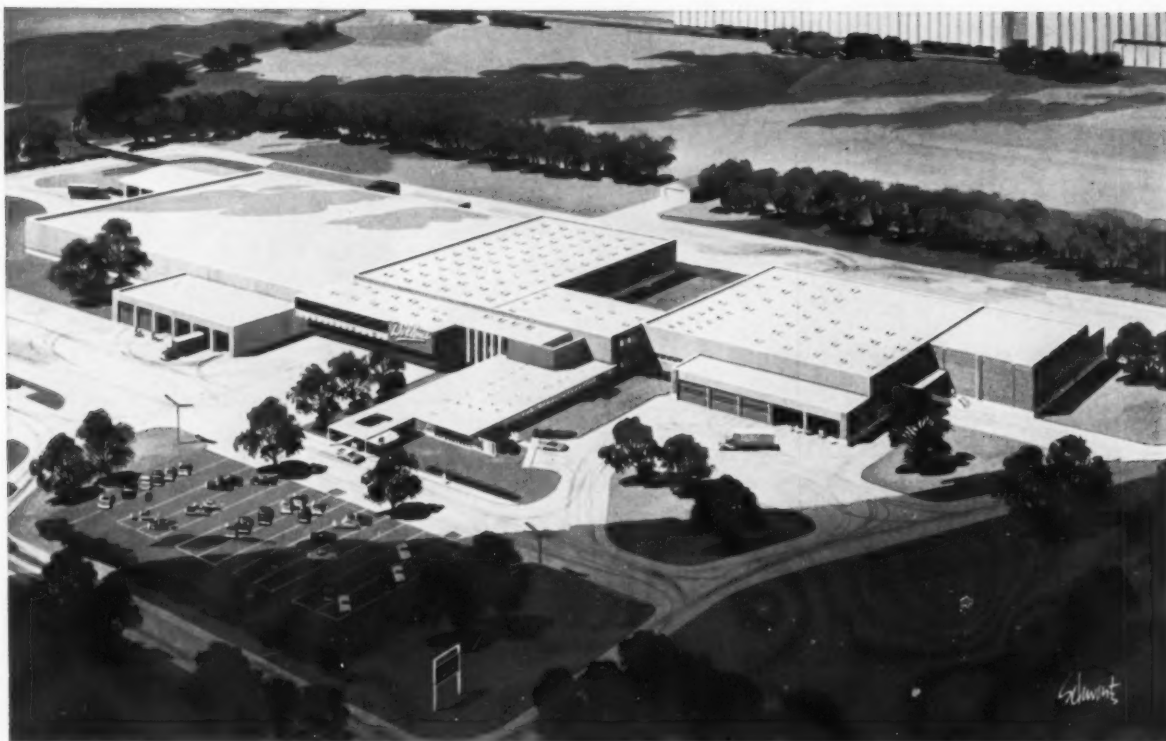
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Dillon's Model Food Center, Hutchinson, Kansas

STYROFOAM®



Dow Approved Insulation Contractor for new Food Distribution Center
... "so efficient we had only to review inspection reports"

"We selected a Dow Approved Insulation Contractor to install 370,000 board feet of Styrofoam in our new Food Center," says Ray E. Dillon, President of J. S. Dillon & Sons Stores Company, Inc., Hutchinson, Kansas. "We've used Styrofoam insulation board in our stores for several years and its performance has been excellent."

"The AIC (Mid-Continent Industrial Insulation Co. of Kansas City, Kans.) gave us the best possible installation at reasonable cost. He took care of all details and was so efficient that we had only to review weekly inspection reports."

Dillon's new Food Center is completely insulated with Styrofoam in produce wet-and-dry coolers, banana



Mr. Ray E. Dillon, President,
J. S. Dillon & Sons Stores
Company, Inc.

cooler rooms, and in the frozen food section. Styrofoam provides a *permanent* low "K" factor, won't soak up water or water vapor, won't freeze, swell or crack. And Styrofoam is so easy to handle that installation time is reduced to a minimum.

The Dow AIC seal is displayed only by insulation contractors carefully selected for their excellent business reputation and high quality workmanship. For the names of the AICs nearest you, write THE DOW CHEMICAL COMPANY, Mid-

land, Michigan, Plastics Sales Department 1541EH8.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.

THE DOW CHEMICAL COMPANY



Midland, Michigan



Stops moisture...

STYROFOAM® for pipe covering insulation

Low-temperature pipe covering made of Styrofoam does an excellent job and requires minimum maintenance. Its unyielding resistance to moisture and its permanent low thermal conductivity prevent condensation and dripping—reduce heat transfer.

Pipe covering made of Styrofoam will not crack or split from thermal shock. Since it does not absorb water, it is not affected by ice build-up around uninsulated valves. It's lightweight and easy to apply. A complete line of pipe and vessel covering made from Styrofoam is available from the following fabricators:

COLUMBIA ASBESTOS CO., Portland, Ore. • ENGINEERED FOAM PLASTICS CORP., Elkhart, Indiana • GLO-BRITE PRODUCTS INC., Chicago, Illinois • KENNEDY INDUSTRIES, Los Angeles, California • KRANSCO MANUFACTURING COMPANY, South San Francisco, California • MMM INCORPORATED, Houston, Texas • ROBINSON INDUSTRIES, Coleman, Michigan • STYRO FABRICATORS, Kansas City, Kansas • STYROFORMICS, INC., Somerville, Mass. • STYROPLASTICS, INCORPORATED, Minneapolis, Minnesota • TUFFLITE PLASTICS, INC., Ballston Spa, New York



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THE REFRIGERATION & AIRCONDITIONING BUSINESS/AUGUST 1961

People ON THE MOVE

Trane Co. adds four men to its sales offices. **Jacob R. Groeschel** joins Appleton, Wisc., office; **Richard W. Corbett** to Peoria, Ill.; **Joseph A. Ricciardi** to Albany, N.Y., and **Herbert W. Hendrickson** to St. Paul, Minn.

Frank F. Altman, manager of the o.e.m. coil department for Danville Div., Bohn Aluminum and Brass Corp., died May 8 in Danville.

R. E. Albert is named chief engineer of special development group at Day & Night Mfg. Co. **Ralph Gieser** succeeds Albert as chief of advance engineering.

Worthington Corp. appoints **Paul R. Des Jardins** as manager, engineering planning. He joined the company in 1938 and most recently was manager, product and marketing planning department.

Friedrich Refrigerators, Inc., a subsidiary of Ling-Temco Electronics, Inc., names **C. Dwight Hilton** assistant sales manager of its commercial refrigeration division. He was formerly southeast regional manager.

Westinghouse Electric Corp. assigns **S. R. Hill** as central region sales manager for its airconditioning division with offices in Pittsburgh, Pa.

Frank H. Post becomes vice president, marketing for Robertshaw-Fulton Controls Co. Since early 1956 Post has been vice president and general manager of the company's Thermostat Div. in western Pennsylvania. Replacing Post is **Arnold C. Hansen**, who has been assistant to the general manager of the firm's Grayson Controls

Div., Long Beach, Calif. Hansen has been elected an assistant vice president of the company.

Douglas E. Phillips and **Carl O. Lindahl** are named project engineers at Kohlenberger Engineering Corp. The firm appointed **Ernest S. Langer** applications engineer to replace Phillips.

Charles Phillips replaces Ray Long as Baltimore branch manager for Ilg Electric Ventilating Co. Phillips was a sales engineer in Ilg's Philadelphia office.

William H. Roberts joins York Div. of Borg-Warner Corp. as general product manager. He was formerly development manager for Carrier Corp.

New director of sales for Virginia Chemicals & Smelting Co. is **J. A. Weatherhead**. He joined the company in 1954 as manager of the chemical sales department.

R. E. Albert is appointed chief engineer, special development group by Payne Co. His former position as chief of advance engineering is being taken by **Ralph Gieser**, who headed Payne's value analysis program.

John A. Feeler is appointed sales engineer for the St. Louis, Mo., territory of the Lewin-Mathes Co. Feeler has been with the company three years.

Chrysler Airtemp promotes **Carl T. Miller** to advertising manager. He is succeeded as sales promotion manager by **John F. Zaino**, who was supervisor of advertising production.

Continued on page 87

Contractor-Dealer **ACTIVITIES**

RACCA-National names Joseph Koach executive director; office to move

Joseph L. Koach has been named executive director of Refrigeration and Air Conditioning Contractors Association-National, according to association president Walter McCarty.

The appointment is effective August 1, said McCarty, who also announced that the association has moved its headquarters from Washington, D.C. to the Kemper Insurance Building in Chicago.

Koach brings a background of 13 years of organization management experience to RACCA-National, including seven years as a national association executive.

He has been administrative assistant to the executive director of Linen Supply Association of America since 1957.

In his new position, the 36-year-old Koach will coordinate and carry out policies of RACCA-National's board of directors in directing all activities and services of the association.

He has been assistant executive director of Greater National Capital Committee, Washington's visi-



JOSEPH L. KOACH

tor's and convention bureau and assistant public relations director and manager, Mental Hospital Services, American Psychiatric Association, Washington.

Koach has attended a seminar for trade association executives at University of Illinois and executive management institutes at Michigan State, Harvard, and University of California.

Journeymen instruction includes good will class

A class in customer relations has been added to the regular journeymen instruction curriculum by Refrigeration and Air Conditioning Contractors Association of Southern California and Refrigeration Fitters, branch local No. 250.

This is a pilot program and is being conducted over a 13-week period. More than 15 journeymen are enrolled.

"This is an experiment for journeymen in solving problems in human relations with which they are confronted in their daily contact and dealing with the customer," training coordinator Harry Bowe said.

N.J. contractor moves

Contracting Engineers, Inc. has moved into a new building in Nutley, N.J. L. Lee Richardson is president of the company, which designs and installs heating and airconditioning systems for small commercial application.

Limbach adds two

William S. Wilson, Jr., has been named piping superintendent in the Pittsburgh Branch of Limbach Co.'s mechanical department. Named as estimating manager there was Frank W. Brandon.

Hanson names committee for '62 RACCA convention

Six members of RACCA of Southern California have been named to the committee for the 1962 Refrigeration and Air Conditioning Contractors Association convention by chairman Al Hanson.

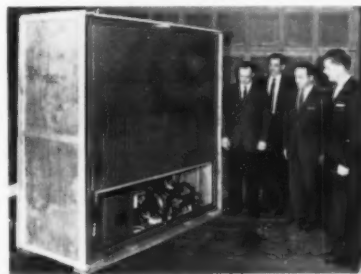
Chosen to help Hanson are Jack Carney, Sam Elster, Bob Heisler, Jake Jacobsen, Bert Stren, and Herb Schuch.

Convention headquarters will be the Biltmore Hotel.

D-B picks 1st national package unit franchise

Certified Refrigeration, with an-troit, has been picked as the first franchised distributor for packaged airconditioners by Dunham-Bush, Inc. The move coincided with initiation of the manufacturer's new national marketing program built around franchise distributors.

Besides selling the cooling units, the distributors will also provide



VIEWING a newly-arrived and uncrated packaged airconditioner are (left to right): Robert J. Crawford, president and general sales manager; William B. Anton and John Ellison, sales engineers; and George V. Carless, vice president-district sales manager.

servicing, parts, drafting, estimating, and engineering facilities for dealer-contractors.

Certified Refrigeration, with annual sales exceeding \$1 million, is one of the largest independent airconditioning and refrigeration distributors in the metropolitan Detroit area.

how do distributors rate
NOR-LAKE refrigeration products?



"Nor-Lake means more sales!"

...says Dave Friedman, of Paramount Fountain & Restaurant Supply Corp., Providence, R. I.*

"Our experience indicates that NOR-LAKE equipment gives dealers a number of sales advantages. In our highly competitive markets where ruggedness, dependability and long life are so important, NOR-LAKE features add up to increased opportunities for increased profits.

"First, NOR-LAKE has a full line of quality equipment with 'Fine-Line' appearance. This wide range of attractive refrigeration products allows us to effectively compete and bid on a diverse number of applications.

"We've discovered that NOR-LAKE's years of experience are our best assurance of customer satisfaction and increased future acceptance of our sales efforts. Finally, with NOR-LAKE it's possible to add extra profit dollars to our account through savings in sales time or trouble and service calls.

"To put it simply, NOR-LAKE means more sales because NOR-LAKE has more to offer."

*Paramount Corporation is one of the largest suppliers of equipment for restaurant and hotel chains and institutions on the East Coast.

NOR-LAKE'S "FINE-LINE" IS A FULL LINE

- freezers
- ice cube makers
- refrigerators
- bottle coolers
- walk-ins
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**ALL MODELS AVAILABLE IMMEDIATELY,
IN STAINLESS STEEL IF DESIRED**

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Please rush FREE illustrated information on ☐ Freezers
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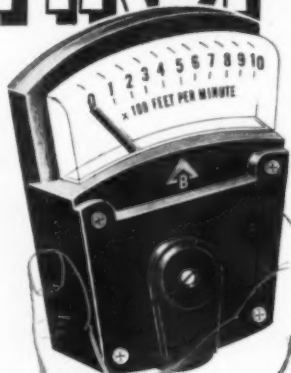
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Takes guesswork out of checking the operation of forced air heating, cooling and ventilating installations. Use it to:

- ✓ Check air flow at registers, grilles, diffusers, convectors.
- ✓ Spot objectionable air movements in rooms.
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The ideal pocket-size air velocity indicator; direct-reading; can be used for checking air flow through openings as small as 1/4" in diameter. Range 0-1000 ft./min. Supplied with pocket case.

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BUSINESS Trends

Continued from page 16

Heat pumps show major gain as ARI figures jump 23%

First quarter figures for manufacturers' shipments of unitary airconditioners totaled 77,551 units, as reported by Air-Conditioning and Refrigeration Institute. This is a gain of 23.4% over shipments in the Jan.-Mar., 1960 period.

These ARI figures exclude coils, but include heat pumps.

Shipments of heat pumps showed almost a 60% increase over '60 figures. Of the total 12,160 heat pumps shipped during the first three months, 8200 were self-contained.

Each of the three classifications under split systems showed gains this year. Condensing units rose 28.4%; airconditioning coils with blower were up 32.1%; and airconditioning coils without blower jumped 33.2%.

A complete breakdown of the first quarter, 1961 vs. first quarter, 1960 is shown below.

Product description	First quarter 1961	1960	Change over last year
AIRCONDITIONERS¹			
Self-contained	17,180	16,309	+ 5.4%
Remote-condenser	1,353	1,390	- 2.7%
Refrigeration chassis	590	259	+127.8%
YEAR-ROUND AIRCONDITIONERS²	2,174	2,951	- 26.3%
HEAT PUMPS³			
Self-contained	8,200	5,172	+ 58.5%
Other than self-contained	3,960	2,438	+ 62.4%
SPLIT SYSTEMS			
Airconditioning condensing units	44,094	34,337	+ 28.4%
Airconditioning coils with blower	10,349	7,837	+ 32.1%
Airconditioning coils without blower	33,390	25,064	+ 33.2%
GRAND TOTAL⁴	77,551	62,856	+ 23.4%

¹Except window and wall types

²Except heat pumps

³Except room airconditioners

⁴Excluding coils

CONDENSED SUMMARY BY SIZE

JANUARY-MARCH 1961 (3 months)				
SIZE	By Condenser-Type		Total Units	Percent of Change from 1960
	Air or Evaporatively Cooled	Water-Cooled		
	BA	BO	E	C
Under 27,000 Btu/hr.....	15,793	25	15,818	+ 87%
27,000-32,888 Btu/hr.....	6,007	3	6,010	+ 30%
33,000-41,888 Btu/hr.....	23,777	1,158	24,935	+ 22%
42,000-53,888 Btu/hr.....	8,570	1,026	9,596	+ 28%
54,000-64,888 Btu/hr.....	6,886	2,239	9,125	- 17%
65,000-96,888 Btu/hr.....	3,755	1,375	5,130	+ 1%
97,000-134,888 Btu/hr.....	2,174	1,015	3,189	+ 29%
135,000-184,888 Btu/hr.....	778	481	1,259	+ 24%
185,000-248,888 Btu/hr.....	310	392	702	+ 6%
250,000-318,888 Btu/hr.....	42	249	291	- 25%
320,000-378,888 Btu/hr.....	43	171	214	- 31%
380,000 Btu/hr and over.....	32	149	181	+129%
TOTAL	89,268	8,283	77,551	+ 23%



HOW DO YOU JUDGE A DRIER ?

BY PERFORMANCE OR BY BASELESS STATISTICS ?

The way some manufacturers talk about filter area you'd think that the bigger the block of desiccant the better job it does. Poppycock! The simple scientific fact is that filter area has very little to do with *filter capacity*...and drying efficiency. The new Ansul "System Boss" drier offers far and away more filter capacity in less space than any other drier.

Another thing...why build a drier that's as fragile as a china tea cup? Most driers *do* get banged around, dropped and abused in shipping and handling. Drop an ordinary drier with a bloc-type desiccant on the concrete and you've got a basket case—waste basket, that is! Drop a "System Boss" and the worst thing that happens is a small dent. There's no core to break or come loose..."Andrite" pelletized desiccant is held securely under rigid spring pressure. Metal flare protectors...2500 psi bursting strength...rugged construction...the Ansul "System Boss" is the best drier ever built and the best value.

See it, drop it, install it...and learn how much abuse (and how much dirt and moisture) a real drier can take. It's handled by better refrigeration wholesalers everywhere.

ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN

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1 INSULATION FITS
EVERY SIZE PIPE...
ANY TYPE FITTING

Mortell NoDrip TAPE



No tools. No vapor-seals, no fasteners, brads or adhesives. Wrap NoDrip Tape spirally around any size pipe, joints, tees, valves, angles... and the job's done! NoDrip Tape is a pliable, cork-filled, self-adhering product. Forms a permanent air-tight, 100% vapor- and moisture-proof jacket. Stops condensation drip, sweating, frost. Ends rust and corrosion.



MORTELL NoDrip PLASTIC COATING

... For big areas, large pipes, tanks, air ducts. Another fine Mortell refrigeration product. Applies with brush or trowel to metal, concrete, brick, plaster, tile or composition surfaces. Permanently stops condensation, rust, corrosion.

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RECENT

Installations

Continued from page 34

Bowl lanes strike cooling profits

COOLING MAKES MILWAUKEE BOWLING comfortable year-round at Strachota's Bowling Lanes, where the lanes used to close in the summer. Now a battery of Mueller Climatrol airconditioning units cool the lanes which were originally an old theater.

The contractor installed four units to handle the upper floor's lanes and barroom. The units are connected to adjustable ceiling diffusers which replaced existing ones except near the pinspotters. Two other units are on the roof. Suction gas lines run down an old ventilating



shaft and cooling coils installed in the shaft utilize the old ventilating system. (See top photo).

One cooling unit is mounted above a door jam and cools the main floor barroom. Modern discharge grilles (seen in bottom photo) make bowling more comfortable and have transformed the sport from a seasonal to a 12-month operation for owner Reuben Strachota. Bob Oelstrom of Butler Heating, the dealer, supervised the installation.

Says Strachota, "In my other bowling lanes I have a 60-ton unit and this multiple system operates more economically and provides greater comfort and better humidity control. As a result, it is just good business to have more than one unit because airconditioning helps us maintain a profitable bowling business all year."



SHOWN: A few of the tremendous line of 120 Kold-Draft ice cubers.

120 Different models to choose from... Only by *KOLD-DRAFT

• ALWAYS A PERFECT CUBE
... CLEAR ... PURE ... SOLID

• COMPLETELY FLEXIBLE
... ADD-A-UNIT FEATURE

• GUARANTEED
CAPACITY RATINGS

The unique Add-A-Unit feature of Kold-Draft ice bins and ice cubers afford unsurpassed flexibility in ice making and bin capacity, and allows expansion of either or both as your business grows... automatic ice crusher is available for most models... its compactness permits use where space is extremely limited... all models available in beautiful Pearl-tone grey baked-on vinyl enamel or stainless steel... air cooled, combination air/water, or straight water... a model to fit all requirements whether large or small... send coupon for full information.

*TRADEMARK REG. U.S. PAT. OFF.

KOLD-DRAFT DIVISION

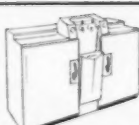
©1961 UNIFLOW MFG. CO.

UNIFLOW MANUFACTURING COMPANY • ERIE, PENNSYLVANIA

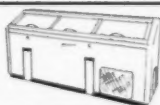
A complete
line of
refrigeration
products
from
ONE
reliable
source



WATER COOLERS



BEER DISPENSERS



BEVERAGE COOLERS



SOFT DRINK DISPENSERS



WALK-IN COOLERS



KOLD-VUE
BEVERAGE
MERCHANDISERS

TOM MARTIN, Sales Manager
KOLD-DRAFT DIVISION
UNIFLOW MANUFACTURING COMPANY
ERIE, PENNSYLVANIA

YES, we are interested in distributing Kold-Draft ice cubers... please send complete literature and prices.

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FIRM _____

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CITY _____ ZONE _____ STATE _____

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These four **RANCO ADAPTABLE REPLACEMENT SERIES** do the work of thousands!

And that means you're set to handle 90% of all control calls! Ranco Adaptable series are designed to assure an accurate replacement and return the appliance to operation with no downtime, no callbacks. On-the-job replacement is fast, simple, more profitable.

All have full temperature range adjustment on a primary shaft with profile cam attached. There is no internal range adjustment. All have mounting brackets which adjust for height and hole spacings. Dial shaft extensions adapt to any required length. Bulbs are quickly formed from capillary tubes with Ranco's new forming tool. Switch terminals are quick-connect type with slip-on adapters provided.

You're passing up profits if you are not using these Ranco Adaptable Replacements for freezer and ice cream cabinet, refrigerator, air conditioner, water and beverage cooler applications. See your wholesaler right away for complete details.



Ranco[®]
INCORPORATED
COLUMBUS 1, OHIO

In Canada: Ranco Controls, Canada, Ltd., Toronto 18, Ontario

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AUGUST 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

Service Clinic FOR CONTRACTORS

A MONTHLY TRAINING GUIDE AND REFERENCE FILE FOR YOUR SERVICE DEPARTMENT

Good housekeeping will help keep cooling equipment running efficiently

MR. CONTRACTOR:

Watch for the Service Clinic every month. Its buff-colored pages make it easy to find. Pull out the complete section and pass it on to your installation and service department. The material in this section is especially selected, written, and edited to help these men do a better job.

FRED W. J. LIU, PH.D.

director of research, Lester Laboratories, Inc.

YOUR CUSTOMERS may be spending more money than they need to in order to keep their airconditioning and refrigeration systems operating properly.

But you can help them cut service calls and needless expense by making clear to them the importance of regularly cleaning coils, fins, and fans. They can have their own maintenance men do this if they want, or they can sign up for a maintenance contract which provides this service periodically.

If coils aren't kept clean, they become coated with light oil, grease, and smoke tar deposits. Then dirt and lint clings to them and effectively insulates the heat transfer surface. This reduces heat transfer efficiency and restricts air flow over the coil. Result: a less efficient system, an overloaded compressor, greater power consumption, and more and more service calls.

Proper use of filters on the intake side of the coils can cut down the rate at which the coil surfaces load up with foreign matter, especially if you clean or change these filters regularly. But filtration is only about 70% effective. The other 30% of foreign matter passes through the filter and onto the coil and fin surfaces.

You can see the effect of such coatings on the heat transfer effectiveness of the coil in the following table:

Continued on page 66

SERVICE CLINIC FOR CONTRACTORS

Material	Relative Thermal Conductivity
Copper	1000.
Aluminum	500.
Paraffin oil	0.35
Lint (cotton)	0.14
Corkboard	0.10

Of course you'd never insulate heat transfer surfaces with corkboard. Yet the loss of heat conductivity due to a mixture of oil, dust and lint is about as bad.

So it's apparent that even a small build-up of airborne materials in every building can greatly reduce any system's efficiency. In fact, a loss in efficiency of 25% is common even when there's only a 1/32" accumulation of particles on coil surfaces. An often greater loss occurs when dirty and clogged fin and coil surfaces reduce the air flow over the cooling coil.

The amount of cooling depends largely on the volume of air that passes over the heat exchange surface: the less air volume, the less cooling. One owner measured the air flow in his cooling system before and after cleaning the coil and fin surfaces. He found by using

a draft gage that there was an average of 1" of water on the gage before cleaning and an average of 2.9" of water after cleaning. This owner also found there was almost a 20% increase in air velocity in the ducts after cleaning by measuring it with a Pitot tube. To be exact, the average duct air flow velocity before cleaning was 1364 cfm, while it was 1630 cfm after cleaning.

A loss of 30 to 40% of the system's original capacity is common when the loss of heat transfer and reduction of air flow are combined. This means that the system needs 30 to 40% more power. Result: overloading of the compressor, with consequent extensive repairs and early depreciation.

Air or water won't do thorough job

Some methods commonly used for cleaning coil and fin surfaces simply don't do the job. One is just blowing a stream of air over the surfaces or washing them with a pressure stream of water. This only removes the loose dirt. Oil, greases, tars, and gums don't dissolve in water and can't be removed by air or water pressure.

Steam cleaning the surfaces is considerably more effective, but it requires a big initial investment in

Spray on the cleaning solution . . .



equipment and often it can't be used because of condensation on the walls and equipment, or because the equipment to be cleaned is not easily accessible. Also, the heat sometimes just bakes on the dirt rather than removing it, creating an even greater problem.

Now, however, several chemical compounds are available that have been developed for this special purpose. They do the job quicker and better in many ways than air, water, or steam.

For example, one of these compounds is a concentrate that's not toxic, flammable, or corrosive. It won't damage metals, personnel, or painted surfaces because it is essentially neutral, being neither highly acidic nor alkaline.

Dilute the concentrate with water, spray it onto the coil and fin surfaces, wait a few minutes for the chemical action to take effect, then wash it off the surfaces with a water rinse.

The solution penetrates the soil accumulations and loosens them so a stream of low pressure water will simply wash them down the drain. It restores the original heat transfer efficiency of a coil's exterior surfaces and permits an unhindered air flow through fins and over the coil. Any unskilled worker can do the job. It takes only a few minutes even on a big unit. And just the reduction in power costs resulting from

the clean coil often will compensate for labor and material costs.

This concentrate also does an effective job of cleaning permanent filters. Simply spray them with a diluted solution of the concentrate or dip them into a tank of the solution. Again, let the chemical action go to work and rinse the filters with a stream of water. You don't have to heat the solution or apply a hot rinse.

Coating filter makes it more effective

After you've cleaned the filter, apply another coating of the chemical to the filter. This serves as an excellent filter adhesive. Because the chemical is water soluble, the next time you clean the filters the soil will easily wash off.

Many companies have also found that this concentrate will clean dirty fans to improve the velocity and air flow volume through the system to provide more cooling at less cost.

Under any conditions, you should clean the exterior surfaces of coils, fans, and fins at least once a year or as often as needed.

Labor and material cost of this chemical method of cooling system cleaning is low enough that it should be a part of every regular maintenance program. ♦

... then rinse it off with water





Seals duct joints with caulking gun

IF YOU CAN'T FIND A PRODUCT specifically designed for the job you want to do, look around. You may be able to take a product developed for some other purpose and adapt it to your particular needs.

That's what R. H. Bishop Co. of Champaign, Ill., did when it tackled the job of providing ductwork for the airconditioning system in the new Men's Residence Halls at the University of Illinois.

The company figured it could speed up considerably the fabrication and installation of the 65,000' of ductwork required if it could find a duct joint sealing adhesive which could be applied with a caulking gun.

It discovered that a rubber cove base adhesive (Tuff-Bond 3-A) produced by Goodloe E. Moore

had just the properties needed to make this method of joint sealing practical.

Its thick buttery consistency, Bishop found, makes it suitable for use in an ordinary caulking gun. Its slow setting characteristic makes it possible to apply the adhesive and then butt and bolt the joints together without losing the adhesive's sealing effectiveness.

According to Charles L. Amacher of the Bishop company, the ability of this adhesive to remain pliable yet strong through a temperature range from -35 to 300 F insures a permanently effective seal against water vapor and heat loss through the duct joints. The compound also is water dispersing, heat resistant, and fire retardant. ♦



Armaflex sheets . . . the faster, better way to insulate large fittings

Contractors save time when they use Armaflex foamed plastic sheets to insulate large fittings in the sub-zero to 200F range. Armaflex sheets often can be installed at lower costs than conventional insulations, too, and they do a more efficient job. They are easily cut for accurate fit, quickly positioned and secured with Armstrong Adhesive at the joints, need no mechanical support, and are vaporproof. The completed installation has a clean, professional look, and a minimum amount of cleanup is required.

Armaflex sheets are one of a complete line of Armstrong products available through more than 300 leading wholesalers. The line includes flexible Armaflex 22 Pipe Covering, Rigid Armaflex, and Armaflex Finishes and Adhesives. For the name of the wholesaler nearest you, and for more information on Armaflex products, write today to Armstrong Cork Co., 2208 Roth Ave., Lancaster, Penna.

Armstrong INSULATIONS

ARMAFLEX 22 • RIGID ARMAFLEX • SHEET ARMAFLEX • ARMAFLEX FINISH • ARMAFLEX ADHESIVES

circle 11 on reader service card



Nobody beats La Crosse on quality... and this All-New REACH-IN proves it! Gleaming white enamel or stainless steel exterior... all aluminum exterior... fully adjustable shelves... easy-sliding Thermo Glass Doors. Top capacity... a full 35 cubic feet holds up to 590 quart milk cartons or over 1,000 7 oz. bottles. Top economy... dependable operation year after year.



EXPORT OFFICE: 60 EAST 42nd STREET, NEW YORK • CABLE: EXPEDITE



with **S-K ASSURED PREVENTIVE MAINTENANCE**

Where scale, corrosion, algae and slime are day-to-day problems... with Stiles-Karlsonite products for assured preventive maintenance... you'll increase the overall efficiency of all your equipment... reducing operating costs.

Through Karlsonite—a low cost efficient water conditioner—elements in water that prove harmful and damaging to equipment

are suspended and inactivated. You get crystal clear... non-corrosive... non-clogging... non-precipitating water... always at lowest cost!

Write today for our 24-page brochure... with the full story:



STILES-KARLSONITE CORPORATION
DEPT. SKB WAUKEGAN, ILLINOIS

circle 56 on reader service card

USEFUL Literature

Continued from page 21

NOW AVAILABLE from Industrial Div., American-Standard, is a new 8½ x 11" illustrated bulletin (No. 4104) on the Model CRD direct-drive centrifugal roof ventilator. The brochure discusses specific design features and operating characteristics of the ventilators. Selection and rating tables indicate relative quietness ratings, motor hp, fan speeds, and fan deliveries for different static pressure conditions. Simplified installation drawings are correlated with tabular data to give important dimensions for use in engineering layouts. Also provided is a hypothetical set of typical specs as a guide when the ventilators are ordered.

circle 213 on reader service card

"WHO'S WHO in certified performance ratings in air moving devices" is the title of a new reference bulletin from Air Moving and Conditioning Association, Inc. It contains the names of all manufacturers whose products are licensed to use the association's certified rated performance seal. Products licensed are listed under the producers' names by wheel sizes and catalog numbers. The AMCA "bible" is divided into three types of air moving devices: centrifugal fans, axial and propeller fans, power roof ventilators.

circle 214 on reader service card

A BROAD LINE of single- and 3-phase and 1/20 to 500 hp direct current motors is described in Bulletin 010, a motor application guide from Century Electric Co. Gearmotors and selective speed drives are also included. Two motor selection charts match motor characteristics to specific applications for the three main types of motors are here as well as rating and dimension tables. The 16-page brochure also has factors in motor selection, a motor selection chart, frame sizes, mounting dimensions, and mechanical variations, all illustrated.

circle 215 on reader service card

DO YOU KNOW your "O-B" valves? Readers of Bulletin 1496-V from Ohio Brass Co. do because it gives them quick facts about the bronze valves, their feature-advantages and applications. The pocket reference guide offers condensed listings of standard and low pressure gate, globe, angle, check, and special valves. There's also a figure number comparison chart, application and installation tips, and distributor advantages.

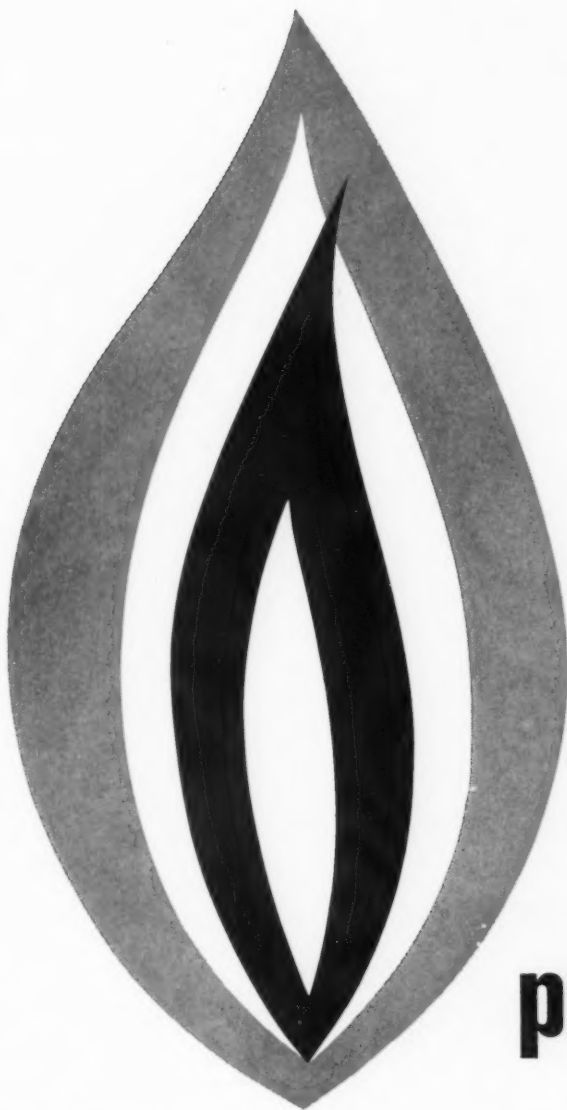
circle 216 on reader service card

COMPACT air handling units for cooling, humidity control, and heating are presented in Form 6811 from Dunham-Bush, Inc. The release contains a cross-section view of an air handler with its various design features explained. There are also photos on its components of face and bypass dampers, mixing boxes, filter sections, and humidifiers. Charts on approximate overall dimensions, both horizontal and vertical, and nominal ratings wind up the release.

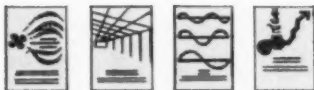
circle 217 on reader service card

THE PACKAGE TEAM for your pipe corrosion problems is "Chasekote" and "Chasewrap" pipe wrapping, say two bulletins from Corr-Prev Div., Chase & Sons, Inc. A 1-page release asks you to try the tape coating team, offering sample rolls of both products. The second brochure is more detailed and lists and illustrates the many advantages and applications of the wrappings. It has sections on corrosion problem and the firm's engineering service and wrapping system as well as a pipe coverage table by nominal pipe sizes in inches. A page on illustrated application instructions completes this brochure.

circle 218 on reader service card



how to overcome basic heating problems



FREE FROM REZNOR:

Four new "Reznor Heating Handbooks" to help you solve common and uncommon problems in commercial and industrial heating.

In these new handbooks, published by the manufacturer of the world's largest selling gas unit heaters, you'll find the latest information on how to use unit heaters and

duct furnaces most efficiently in industrial and commercial installations. Also discussed are such problems as how to design a make-up air system, how to control temperature with direct fired unit heaters, and how to use duct furnaces in heating-cooling systems.

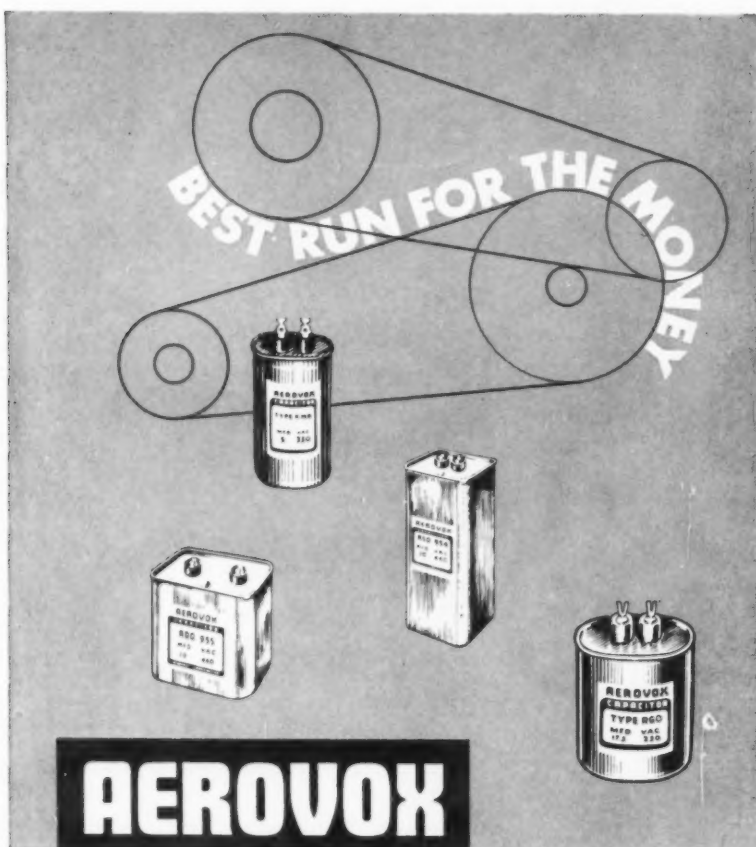
We think you'll find these handbooks valuable as basic working tools. To receive your copies, call your Reznor full-service distributor or nearby district office listed in the Yellow Pages under "Heaters—Unit." Reznor Manufacturing Co., Dept. RAC-8, Mercer, Pa.



REZNOR HEATERS



circle 52 on reader service card



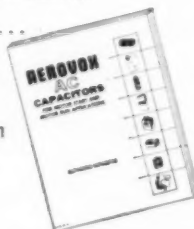
AEROVOX

MOTOR-RUN Capacitors

Handle these motor-run capacitor replacement jobs faster, safer and more profitably by using Aerovox AC capacitors. You'll find just the capacity and voltage combination you need for a stay-put installation with a long service life.

Aerovox capacitors offer you the best run for the money because Aerovox supplies the major portion of all AC capacitors used by original equipment manufacturers in their motors, refrigerators and air-conditioners. Aerovox pioneered the manufacture of AC motor-run and motor-start capacitors and offers engineering know how second to none in the industry.

You can get the capacitors you need . . . when you need them . . . simply by calling on your local Aerovox Distributor. He stocks the complete line of Aerovox AC Capacitors, including hardware and instruments to help you meet the deadlines on those urgent repair jobs. While you're there ask for your copy of the Aerovox AC Capacitor Catalog (MS 59-10). Free only from your distributor. For the name and address of your nearest Aerovox Distributor write to . . .



AEROVOX CORPORATION

DISTRIBUTOR DIVISION

NEW BEDFORD, MASS.

circle 2 on reader service card

Product DATA

Continued from page 28

cessed models. These replace firm's 1500 series, which consisted of three models in 200 to 400 cfm range. New units permit either vertical or horizontal installation.

circle 142 on reader service card

Chemical feeder

Product: "Glaspump" chemical feeder.

Manufacturer: California Scientific Glass Co., El Monte, Calif.

Features: Pumps chemical treatments into cooling towers, evaporative con-



densers, or other unpressurized water systems to control and prevent bacteriological formations. Low-friction, unbreakable "Teflon" stopcock doesn't require lubrication and doesn't move under vibration. Removable, heavy wall glass unit housed in anodized aluminum case with thick, clear plastic front plate. Flow control valve permits 3/4 gpm at line pressures up to 125 psi. Check valve prevents backflow, and there are no moving parts.

circle 143 on reader service card

Gas-fired boiler

Product: Type 22 gas-fired boiler.

Manufacturer: Mueller Climatrol Div., Worthington Corp., Milwaukee, Wis.

Features: Improved sections give 7% greater Btuh capacity than previously; for example, 7-section boiler of 450,000 Btuh input requires 9.4 sq.ft. All sections of parallel ground construction for tight fit between sections. In sizes from 3-section 150,000 Btuh input to 10-section 675,000 Btuh input and for steam or hot water, gravity or forced circulation. Boilers shipped disassembled and all gas controls preassembled and enclosed in insulated cabinet. Can be changed from water to steam or the reverse.

circle 144 on reader service card

Continued on page 74

Descale

**cooling towers,
evaporative condensers,
ice-making machines**

**easily, more safely with
non-fuming Dry Acid Cleaners
based on Du Pont Sulfamic Acid**

EASIER TO USE

Just scoop dry acid cleaners from lightweight, disposable drums into make-up tank. Often can be added directly to equipment . . . no elaborate apparatus required.

SAFER TO HANDLE

These cleaners are dry, non-fuming powders. No danger of spilled or spattered liquids. No danger of corrosive or toxic fumes spreading throughout the building during servicing.

ECONOMICAL

1 lb. of dry acid cleaner does the job of 1.5 lbs. of hydrochloric acid. You'll save on shipping, handling and storage costs.

LESS CORROSIVE

Sulfamic acid is less corrosive than hydrochloric acid; on brass, 60% less; on steel—70%; copper—85%; aluminum—80%. And, with the proper inhibitor, it can be used safely on galvanized steel.

*for more
information,
mail coupon for free booklet
and names of formulators
who offer these compounds*



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

**E. I. DU PONT DE NEMOURS & CO. (INC.)
INDUSTRIAL & BIOCHEMICALS DEPARTMENT, N-2545 R
WILMINGTON 98, DELAWARE**



Please send me ☐ quick-facts bulletin on Dry Acid Cleaners;
☐ names of formulators offering cleaners based on sulfamic acid.

Name _____

Company _____

Address _____

City _____ State _____

circle 20 on reader service card

Product DATA

Continued from page 72

Fastening tool

Product: Model DX-500 fastening tool.

Manufacturer: Hilti, Inc., Stamford, Conn.

Features: Drives $\frac{3}{8}$, $\frac{5}{16}$, $\frac{1}{4}$ " studs and heavy duty pins into steel and concrete. Fastener set on surface then

pushed into it forcibly and slow forward movement of a piston provides power with no trigger action. Blow with 3-lb. hammer magnified by slow burning blank charge, with no initial velocity before impact. Has pre-mounted washer for positive driving guidance.

circle 145 on reader service card

Overhead gas heater

Product: "Sealed/Flame" overhead gas heater.

Manufacturer: John J. Nesbitt, Inc., Philadelphia, Pa.

Features: Sealed combustion system prevents spilling of combustion products

into heated space regardless of conditions inside or outside building. All combustion air drawn from outside building through separate inlet pipes. Exhaust gases and combustion products vented to outside under pressure through separate pipe. If pilot light goes out, purge period occurs before pilot again electrically lighted. High control limit prevents overheating and relay, which operates on amperage draw of motor, prevents main gas valve from opening unless motor running and pilot is lit. Two sizes available with inputs of 115,000 and 85,000 Btuh.

circle 146 on reader service card

Water cooler

Product: Bottle-type water cooler (Model A1B).

Manufacturer: Kelvinator Water Coolers, Columbus, Ohio.

Features: Cabinet in grey baked enamel finish with gold hammer front



panel insert. Vertical wrap-around cabinet 12" square, 36" high exclusive of bottle. Drip receptor of lift-off type and color matched to cabinet. For use in areas where limited quantity of water required. Cabinet finish also in white.

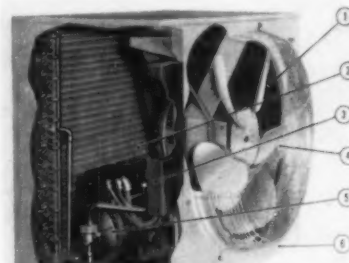
circle 147 on reader service card

Condensing unit

Product: Model HSA2-1103 air-cooled 11-ton condensing unit.

Manufacturer: Lennox Industries, Inc., Marshalltown, Iowa.

Features: Has small-diameter vertical receiver (1) with purge valve and two

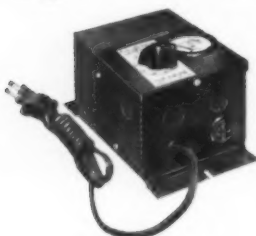


liquid level valves with low inlet opening. Condenser (2) is four rows of $\frac{3}{8}$ "

Continued on page 76

WHAT YOU SHOULD KNOW ABOUT VOLTAGE ADJUSTORS

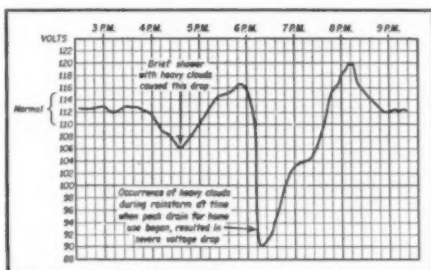
In areas where voltage variation is a direct result of the load on an electric supply line, the performance of every electrical device, motor driven appliance, or equipment using electronic tubes, is limited in efficiency or in normal operating life.



Varying line voltage can be a problem in a big city or on an isolated farm. But, it can be corrected easily and economically with an Acme Electric Variable Voltage Adjustor.

These voltage adjustors can be plugged into any electrical circuit. If the line voltage is below normal, a turn of the control dial can raise the voltage to normal; if the line voltage is excessive, the control dial can be adjusted to reduce the over-voltage to normal.

Check the voltage on every installation and on every service call. Then supply an Acme Electric Variable Voltage Adjustor where the installation indicates a varying voltage condition.



Line voltage variations in typical area during the course of a day's load on the line.

LOW VOLTAGE CAUSES THESE SERVICE PROBLEMS:

- Dull picture in TV receivers. Motors lose their power-punch. Slow heating and below normal temperature in electric ranges. Reduced light output of incandescent lamps.

Write for Bulletin 161 which gives valuable engineering and application data and full specifications.

ACME ELECTRIC CORPORATION

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Acme Electric

circle 1 on reader service card



Scale...

MASTER OF THE SQUEEZE PLAY

When scale takes over in your cooling system, it's only a matter of time until your recirculating water is reduced to a mere drip.

This means trouble. Unless the water in your cooling system is chemically treated the odds are 10 to 1 that scale has already started the squeeze play. Besides reducing the flow of water in pipes scale is an effective insulator, and JUST 1/16 of an inch of scale can reduce heat-exchange efficiency by 50%.

This means high operating cost. The modern way to prevent scale is with the revolutionary new Chemicator.

- Chemicator eliminates the need for periodic descaling, which eats away metal piping, is costly and inconvenient.
- Chemicator automatically prevents scale and corrosion, kills algae and fungus in your cooling tower or evaporative condenser in units of 5 to 300 tons.
- Chemicator is simple in design—inexpensive to install and operate—ready to perform a lifetime of trouble free service.

* Distributed locally in many areas.

Write for
12-page
illustrated
brochure.

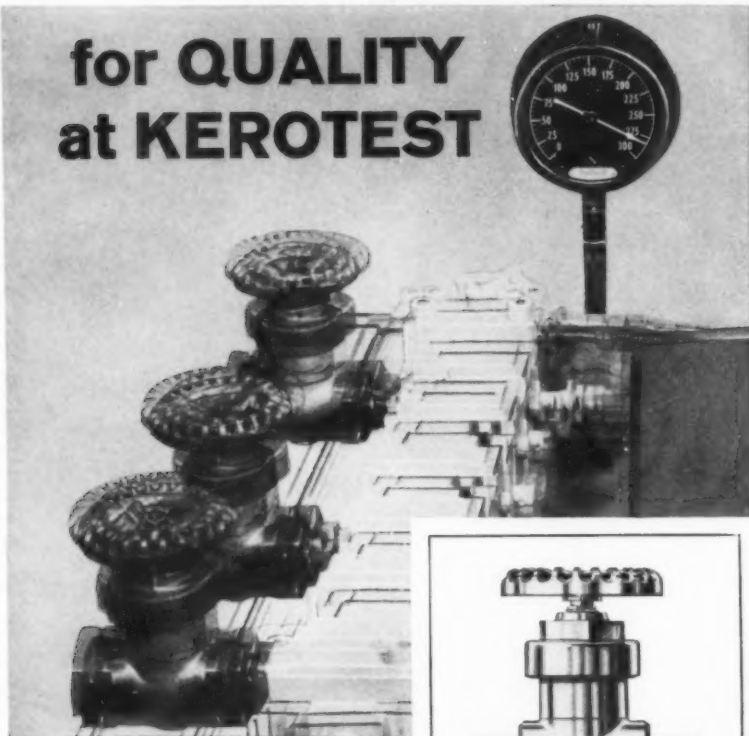
Chemicator

CHEMICATOR DIVISION - ERLN PRODUCTS CO.
700 SO. FLOWER STREET, BURBANK, CALIFORNIA

circle 22 on reader service card

SHAKE^{DOWN}

for **QUALITY**
at **KEROTEST**



Vibration-proof Construction

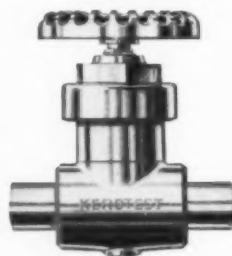
Only precision, quality-controlled construction can take this kind of concentrated abuse. These valves, under a pressurized refrigerant, are vibrated at 3600 cycles per minute for prolonged periods. At intervals throughout the accelerated test, Kerotest engineers evaluate performance and condition of seat seals, diaphragm seals, solder seals and handwheels.

The high standards of material quality and craftsmanship maintained at Kerotest assure you of smoother valve operation and minimum maintenance. Tested and proved design features, quality control at each step of manufacture combine to make Kerotest the best valve that money can buy.

ASK FOR KEROTEST VALVES
AT YOUR LOCAL WHOLESALERS

KEROTEST MANUFACTURING CO.

2504 Liberty Ave. • Pittsburgh 22, Pa.



**KEROTEST 520
DIAPHRAGM PACKLESS
GLOBE VALVE**

The precision-built brass valve for all types of refrigeration and air conditioning systems. Ideal for liquefied petroleum gas bulk plants, pipe line loading racks, laboratory installations, nitrogen, oxygen (degassed) and compressed air applications.

Specify the Kerotest 520 globe valve for operating pressures up to 400 psi and temperatures up to 200°F. Use it in vacuum service applications to 1 micron.

KEROTEST QUALITY CONTROLLED FEATURES

- Replaceable spindle seats for continuous positive seating
- Metal to metal backseating above and below diaphragms
- Beryllium copper and stainless steel diaphragms
- Generous handwheel

KEROTEST

circle 30 on reader service card

Product DATA

Continued from page 74

coils circuited to deliver refrigerant up to 20 F cooler to evaporator. Control box has (3) accessible inside end panel. Rippled-edged aluminum fins flat-bonded to tubing. Axial flow fan (4) is 5-bladed 36" and belt-driven to deliver 8800 cfm. Driven by 3-phase, 1 hp, and shaft ball-bearing mounted. Semi-hermetic compressor (5) is suction-cooled with ambient-compensated overload protection. Standard motor 220/440 v., but 550 v. optional. Equipped with 4-position suction shutoff and 2-position discharge shutoff valves. Crankcase heater prevents slugging. Cabinet (6) of 16 gage, and corners are 14 gage with 10 gage base rails and cross-members.

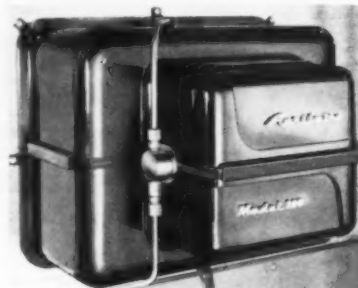
circle 148 on reader service card

Plenum-mounted humidifier

Product: "Aprilaire" plenum-mounted humidifier for furnaces (Models 110, 112).

Manufacturer: Research Products Corp., Madison, Wis.

Features: Has molded phenolic housing that resists water, rust, corrosion,



high temperatures. Readily mounted by using five clips. Water panel easily accessible for changing; motor housing, distributing pan, and drain pan all integral parts of main housing; and top half of housing separate but removable.

circle 149 on reader service card

Damping compound

Product: Spray-on viscoelastic "Vibrodamp" damping compound.

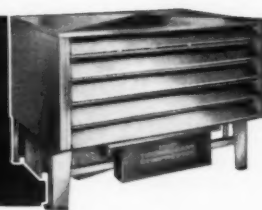
Manufacturer: Korfund Co., Inc., Long Island City, N.Y.

Features: Reduces structurally-borne noise and vibration for sheet metal applications such as air ducts, plenums, pumps, fan scrolls. Provides vibration decay rate of 35-55 decibels per second. Also effective for vibration damping as 1/8" thick, 6 lb. density glass fiber blanket. Resists alkali, grease, gasoline, aliphatic oils, ozone, and sunlight. Renders metal plate acoustically equal to sheet of cork.

circle 150 on reader service card

Continued on page 78

THROW YOUR COMPRESSOR *OUT!



*OUTSIDE, THAT IS!

KRAMER'S outdoor compressor is the only compressor designed to operate outdoors for any application under all temperatures and weather conditions.

Completely assembled, wired, tested and factory run-in, it arrives on the job ready to operate. Simple hookup eliminates costly installation and control adjustment time. Kramer's outdoor compressor ends waste of valuable indoor space.

WRITE FOR BULLETIN

KRAMER OUTDOOR COMPRESSOR

KRAMER TRENTON CO. • Trenton 5, N. J.
46 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

circle 33 on reader service card

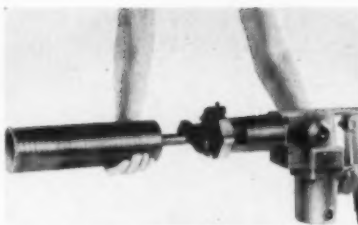
Product DATA

Continued from page 76

Carbide-tipped core bit

Product: Carbide-tipped, hollow core bit.

Manufacturer: Skil Corp., Chicago, Ill.
Features: Can drill through masonry without water cooling. Made as single piece unit with extra thick walls to withstand hammering and power rotation.



Increases hole drilling capacity of firm's Model 726 "Roto-Hammer" from 1 1/2" to 1 3/4" with effective drilling depth of 8 1/2" and Model 736 from 2 to 3 3/4" with depth of 10". Core bit sizes from 1 1/2" to 3 3/4".

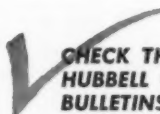
circle 151 on reader service card

YOUR GUIDE TO PROPER SELECTION of HUBBELL CONTROLS

Whatever your needs for CONTROLS for refrigeration, air conditioning, and industrial applications... Hubbell has the exact controls to solve your requirements... the exact controls designed, developed and manufactured to perform... service free... on all equipment.

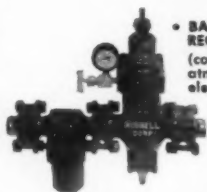
Every step... from castings to finished controls... is under the most rigid Hubbell quality control specifications... with each detailed operation carefully performed by skilled craftsmen. Castings poured in Hubbell's wholly-owned foundry are precision finished; assembled with rugged, dependable components; thoroughly tested; and fully inspected to assure service free controls for long working life and to eliminate downtime and production losses.

The Hubbell GUIDE to Proper Selection of Controls for optimum performance under the most severe infield service enables you to quickly find the Hubbell Controls which add *plus value* to your refrigeration, air conditioning and industrial equipment.



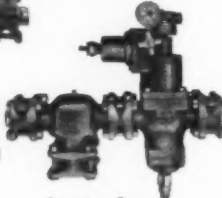
CHECK THIS LIST OF HUBBELL CONTROL BULLETINS

... all full of informative data, specifications, etc. Write, on your letterhead, for copies.

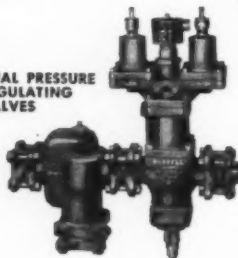


- BACK PRESSURE REGULATING VALVES (conventional and sub-atmospheric — thermal, electric, air operated)

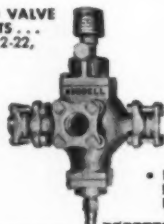
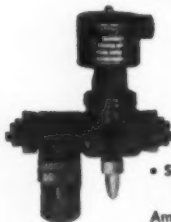
- COMBINATION BACK PRESSURE REGULATING and STOP VALVES



- DUAL PRESSURE REGULATING VALVES

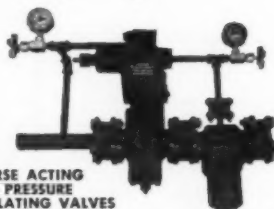


- THREE WAY SOLENOID VALVE for ALL REFRIGERANTS... Ammonia, Freon 11-12-22, Carene 7



- SOLENOID VALVES for ALL REFRIGERANTS Ammonia, Freon 11-12-22, Carene 7... for Water, Brine, Oil, Gas and Chemicals

- REVERSE ACTING BACK PRESSURE REGULATING VALVES



Hubbell engineers are well equipped to furnish you qualified recommendations for your refrigeration, air conditioning and industrial applications CONTROL problems. Send full details for specific answers Dept. 8-D



HUBBELL CORPORATION MUNDELEIN, ILLINOIS

- BACK PRESSURE REGULATOR VALVES • DUAL PRESSURE REGULATOR VALVES • AUTOMATIC SUCTION STOP VALVES • SOLENOID VALVES • GAUGES • SAFETY RELIEF VALVES • 3-WAY REVERSING VALVES

"Casting to finished controls... every inch HUBBELL"

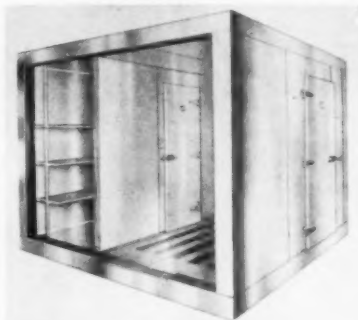
circle 26 on reader service card

Cooler-freezer-refrigerator

Product: Combination walk-in cooler, walk-in freezer, and reach-in refrigerator (Model CF).

Manufacturer: Elliott-Williams Co., Inc., Indianapolis, Ind.

Features: In unlimited sizes, from 6'-10" x 6'-10" to 60' x 60' in various heights. Has curved 3/4" or greater radius on all



interior corners, walk-in door sill at same height as inside bottom, and aluminum alloy or stainless steel interior finishes. Choice of exterior finish of aluminum alloy, anodized aluminum, stainless steel, or porcelainoid.

circle 152 on reader service card

Air curtain door

Product: "Conditionaire" electric unit that forces thin curtain of air across open entry to act as door.

Manufacturer: Curtinaire International, Glendale, Calif.

Features: Keeps hot or cool air in or out and will repel dust and insects. Is



self-contained, connects to standard electrical wiring system, and powered by 1/4-hp motor. Will reduce refrigeration and labor costs of opening and closing doors.

circle 153 on reader service card

Hand saw abrasive blade

Product: "Tuffie SDT-417" abrasive blade for power hand saws.

Manufacturer: Eveready BrikSaw Co., Kansas City, Mo.

Features: Has nylon reinforcing and a process that combines reinforcing material and abrasive grains to expose more cutting edges. For use on such soft materials as concrete block walls, patio block, stone, and transite. Also has arbors which lower blade inventory.

circle 154 on reader service card

Continued on page 80

Are you Signed Sealed and FORGOTTEN?



POSSIBLY you've had personal experience with companies that promise you a whale of a deal from your dealership, but only deliver a minnow.

If so, then it's high time you had a good look at International of Utica . . .

Here's a company that doesn't merely *promise* to work close with its dealers — *it actually does!* Wherever you're located, International has a representative within a stone's throw — a man able, and *willing*, to give the kind of help you need.

And here is a company that doesn't merely *promise* to cut red tape — *it actually does!* At International the line of communication between your distributor and our home office is always open. No long waits for shipments of new units or replacement parts. You get action — not double talk — and you get it *fast*.

It you're tired of being a "forgotten man," why not get the International story today. Write: International Heater Co., Utica, N.Y. Dept. C-81.



Superbly Engineered Heating and Cooling Equipment in an Across-the-Board Range of Styles, Types and Capacities!

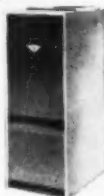
GAS HEATING —



LO-BOY:
75-250,000 BTU input

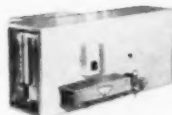


HI-BOY:
75-175,000 BTU input



COUNTERFLO:
75-125,000 BTU input

HORIZONTAL:
80-160,000 BTU input



CONVERSION
BURNER:
70-300,000 BTU input



circle 27 on reader service card

you can

NAIL EVERY SALE

With Coldin's limitless line of types and sizes of quality commercial refrigerators, every prospect can be converted into a profitable customer. Franchises available. Send for literature and catalog.



COLDIN
CABINET CO., Inc.
2800 Webster Ave., N. Y. 58, N. Y.

Product DATA

Continued from page 78

Auto airconditioner cover

Product: Cover for automobile air-conditioners.

Manufacturer: Automatic Radio Mfg. Co., Inc., Boston, Mass.

Features: In 12 colors to blend or contrast with car interiors. Is made from upholstery-type fabric and has self-adhering back by which cover is attached to airconditioning unit. Attachment of cover done quickly and easily whether or not airconditioner installed in car.

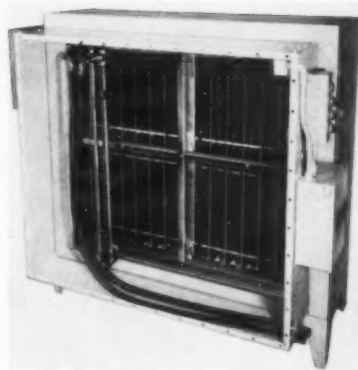
circle 155 on reader service card

Electronic air cleaner

Product: Type HVSC "Electro-Cell" electronic air cleaner.

Manufacturer: American Air Filter Co., Inc., Louisville, Ky.

Features: Has front and back duct connections, drain pan, preassembled washing and oiling mechanism and in 24 sizes from 1000 to 25,000 cfm. Other features — automatic washing schedules will meet needs of each job; no bypass areas within collector cell; precipitator



face area and velocity designed for coil face area and velocity; insulators outside air stream; ionizing wires extend full height of collector cell. Each collector cell has ionizing wires, grounded struts, positive and negative plates, insulators, and ionizer with overall depth of 10".

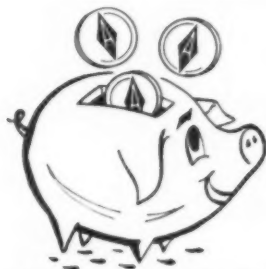
circle 156 on reader service card

Rust-freeing liquid

Product: "Ruster Buster" rust-freeing liquid.

Manufacturer: Armitage Laboratories, Los Angeles, Calif.

Features: Has extending spout to place liquid on any point and spout extends to 14", telescopes, wipes itself dry.



When you specify AIRSERCO PRODUCTS you are buying "THE STANDARD OF THE INDUSTRY" in ...

- TESTING INSTRUMENTS
- PRECISION VISUAL MEASURING EQUIPMENT
- HIGH VACUUM PUMPS, GAUGES, AND ACCESSORIES

Airserco is the "complete line" from a test cord to a full production line facility.



Better than "Money in the Bank!"
Your investment in

AIRSERCO INSTRUMENTS & EQUIPMENT PAYS BIG DIVIDENDS!



Hermetic Unit
Cap-Start Cap-Run
Test Cord

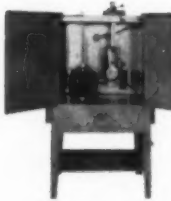


KC-3R High
Vacuum Pump
with Smoke
Arrestor

Relay
Tester



Electric
High Vacuum
Gauge



Hermetic
Compressor
Opener



Portable
Charging Station

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Prof. Know How's CORNER

AIRSERCO
PRODUCT
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MONTH



REFRIGERANT MEASURING TUBE CALIBRATOR

Compensates for
Temperature

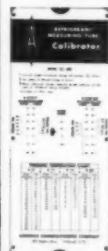
Range: 60°F - 130°F

for
use
with
all
sizes
and
types
of

Refrigerant
Measuring
Tubes
for

R-12, R-114
R-22, R-500

AIRSERCO No. 5250



AIRSERCO MANUFACTURING CO. PITTSBURGH 13, PENNSYLVANIA, U.S.A.

See your wholesaler or write us for complete catalog.

circle 3 on reader service card

Liquid will loosen rusted bolts, screws, shafts, piping, frozen connections and assemblies. Available in 4-oz. container. Is safe for skin, clothes, metals, and friction-type surfaces, containing no acid or alkali. Penetrant comes in plastic squeeze bottle.

circle 157 on reader service card

Centrifugal cooling tower

Product: "Wat-R-Miser" line of cooling towers in 13 models and 5 to 80 nominal tons.

Manufacturer: Drayer-Hanson Div., Hi-Press Air Conditioning of America, Inc., Los Angeles, Calif.

Features: Among them are double-width blowers, hot-dipped galvanized fans and scrolls, V-belt drive adjustable motor pulley and adjustable motor base. Brass spray nozzle throws square pattern for full deck coverage and access doors permit easy access to sprays, eliminators, fan wheels. Has baked galvanized surface finish. Also galvanized steel frame, panel, decking and eliminator.

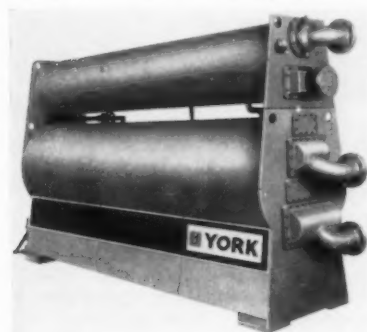
circle 158 on reader service card

Water chilling system

Product: Model EK water chilling absorption system.

Manufacturer: York Div., Borg-Warner Corp., York, Pa.

Features: In 20 capacities, from 50 to 1000 tons, steam or hot water. Has nominal steam rate of pounds per hour of 980 to 18,820 and total unit pump horse-



power from 5 to 20%. Overall dimensions from minimum 140 x 49 x 91" to 422 x 101 x 162" and operating weight from 10,900 to 99,000 lb. Air-tight construction reduces purging need to occasional operation of simple vacuum pump. Water is refrigerant and lithium bromide is absorbent.

circle 159 on reader service card

Mechanical floor crane

Product: Mechanical floor crane with all-steel worm gear.

Manufacturer: Hawkeye Industries, Longmont, Colo.

Features: Boom extends over base or will extend away from it. Base weighted for ballast. Winch pivots on collar and locks to be opposite boom. Unit's overall width 32", height from 6'7" to 9'2", boom extends 12". Model 60C has 1000-

lb. capacity, Model 40C has 500-lb. capacity. Has extra flexible airplane cable and when winch's cranking stopped, no brake needed.

circle 160 on reader service card

Zone control valve

Product: "Zone-A-Trol" straight flow zone control valve.

Manufacturer: Econo Products Co., East Haddam, Conn.

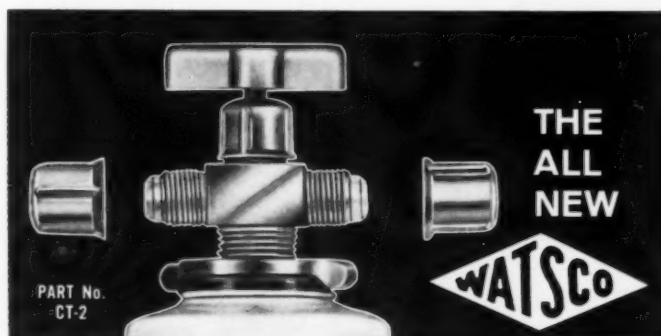
Features: For use on systems with threaded pipe, is easily connected to piping with coupling and union to automatically control water flow to each zone as heat called for by thermostat.



For use with either 2- or 3-wire thermostats, is in $\frac{1}{2}$ and 1" sizes. Is low voltage and thermostat-operated.

circle 161 on reader service card

Continued on page 82



Twin Port CAN TAP VALVE FOR DISPENSING PACKAGED REFRIGERANT

Twin Ports Enable the User To —

Connect a gauge on one port while charging the system through the other port

Charge through any number of cans simultaneously, thus eliminating the need for a charging manifold

The Twin Port Can Tap Valve is made of the miracle *Delrin which has all the properties of brass, yet the lightness of plastic.

CHECK THESE ADDITIONAL FEATURES WHICH ONLY THE TWIN PORT VALVE OFFERS:

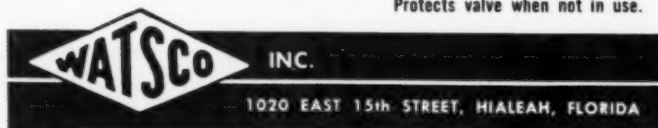
1. One piece steel needle and shaft makes it impossible for the needle to loosen and fall out
2. Easy to grip *Delrin "T" handle cannot twist off or loosen
3. Two sealing caps included for maximum protection
4. Smooth streamline finish
5. Perfect seating — will not leak
6. Packaged in handy plastic pouch

* NEW DUPONT PLASTIC

FOR ADDITIONAL INFORMATION ASK YOUR WHOLESALE OR WRITE TO US, DEPT. B-8

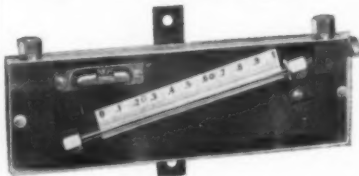


Handy Plastic Pouch is a new innovation in valve packaging — Protects valve when not in use.



circle 67 on reader service card

YOU GET accuracy plus economy in this NEW Ellison "AFS" Air Filter Gage



The new Ellison Series AFS Air Filter Gages show when air filters have become clogged and need changing. Easy to install. Easy to read. Clear Plastic snap-on cover keeps scale clean. A really accurate, well-made instrument at a surprisingly low cost. Eliminate guesswork and cut costs—no need to change filters until gage so indicates. A new addition to the most complete line of air filter gages. Send for Bulletin 214-C.

Since 1896

ELLISON DRAFT GAGE CO., INC.
555 W. Monroe St., Chicago 6, Illinois

Draft Gages, Bell and Diafram—Inclined Draft Gages—Portable Inclined Tube Gages—Vertical Tube Gages, Oil Heavy Liquid, Mercury, Single and Multiple-tube—U-gages—Air Filter Gages, Complete Line—Pitot Tubes—U-Path Steam Calorimeters—Portable Gas Analyzers, Orsat Type—Alarm Systems—Orifice Flanges and Plates—Flow Tube Meters—Condensate Traps.

Product DATA

Continued from page 81

Window airconditioner

Product: "Everest" window airconditioner.

Manufacturer: Fedders Corp., Maspeeth, N.Y.

Features: In four models, has cooling capacity of 24,000 and 28,000 Btu. Model 28C removes 4.5 pints moisture from air per hour, Model 30C takes out 7.3 pints. Has separately powered twin centrifugal blowers and 3-speed blower system, operates on 208-230 v., and features built-in thermostat, exhaust, and ventilation controls. Measures 27 x 37½ x 21½".

circle 162 on reader service card

Drip trap

Product: "F & T" drip trap for draining condensate and venting air in lines up to 2" size.

Manufacturer: V. D. Anderson Co. Div., International Basic Economy Corp., Cleveland, Ohio.

Features: For use in heating and low pressure systems as unit heaters and ventilators, blast coils' return ends, hot water heaters, steam main and riser

drips, and flash tanks. Available in ¼ to 2" connections with maximum gage pressure of 15 lb. Supplied with or without thermostatic air bypass where manual venting or external air bypass specified. Other features — stainless steel sylphon bellows with stainless valve and seat for automatic air vents; interior parts attachable to cover and removable from trap body without disturbing pipe connections. Capacities from 50 to 5750 lb. water per hour. Body and cover of semi-steel iron castings and inlet and outlet connections have standard pipe threads.

circle 163 on reader service card

Sound level meter

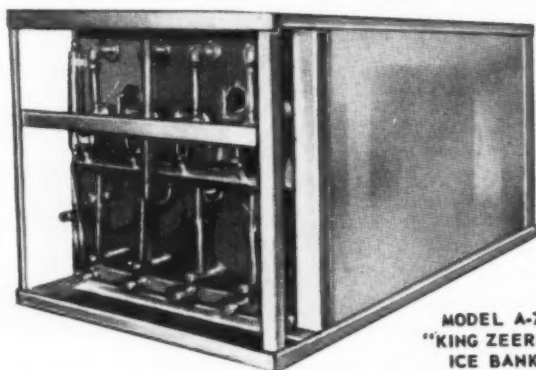
Product: Model 412 sound level meter.

Manufacturer: H. H. Scott, Inc., Maynard, Mass.

Features: Operates over frequency range of 5 cps to 30 kc and ceramic microphone allows unit to be used in 0 to 170 F range. Operates on two batteries and single bias cell, has built-in electro-acoustic calibrator, and circuitry includes seven transistors. Can be used as portable amplifier, voltmeter, attenuator in audio frequency range. Sound level range 24 to 150 db. Controls consist of main attenuator, meter-battery switch, weighing switch, calibration potentiometer, microphone equalizing switch. External connections include microphone and vibration pickup input;

Add a "King Zeero" ICE BANK to Your Refrigerating System for Effectual, Economical Air Conditioning

The "King Zeero" ICE BANK is designed to deliver 32° to 34°F. ice water for recirculation through air cooling coils in exactly the right amount when and where it is needed. It levels off "peak" and "valley" loads. Peak loads many times compressor capacity are easily handled. Ice Banks may be added to increase existing capacity. Refrigerant: Freon, Methyl Chloride or Ammonia.



MODEL A-7
"KING ZEERO"
ICE BANK

CAPACITIES - 500 lbs. to 30,000 lbs. (72,000 B.T.U.'s to 4,320,000 B.T.U.'s) in a single unit. Multiple units may be installed.

The Patented Coils with Built-in Louvres opposed to the flow of water through the ICE BANK provide turbulence. This eliminates a mechanical agitator - insures all the water rubbing all of the ice. No upkeep or repair expense whatever.

The "King Zeero" Ice Storage System of water chilling has definite advantages over direct expansion, or other types of ice accumulators.

Saves power through smaller compressor requirement. Simple construction (no moving parts). Dependable in performance. Low operating and costs.

Let the ice stored during light loads take care of peak loads. The compressor need only handle the average daily load - not the peak.

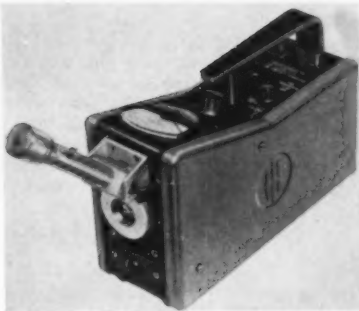
THE KING ZEERO COMPANY

4300-14 W. Montrose Ave. - Chicago 41, Ill.

Manufacturers of Ice Builders - Ice Builder Cabinets - Ice Banks

circle 31 on reader service card





output for earphone, analyzers, recorders; meter circuit input with filter sets; two accessory power receptacles; internal power supply plug. Meter measures 6" x 4" x 11" excluding microphone and weighs 6 lb.

circle 164 on reader service card

Electrical circuitry

Product: "QMB" panelboard with circuit breakers.

Manufacturer: Square D Co., Lexington, Ky.

Features: Circuit breakers in single and twin units, in ratings from 125-255 and 15-100 amps, each in individual



steel enclosure with dead-front construction. Both switches and breakers mount above starters for interlocking. Panelboards accommodate reversing or non-reversing starters, sizes 0 through 4; plug-in circuit breakers through 225 amps; plug-in switches through 200 amps (600 amps bolted).

circle 165 on reader service card

Nylon registers

Product: Registers, grilles, curved blade diffusers with nylon moving parts, blades, and damper mechanisms.

Manufacturer: Air Guide Corp., Miami, Fla.

Features: Frame sections mechanically joined at miter with "Corner-Loc" and gasket sealing by using vinyl gasket extrusion fitted into channel in frame's undercarriage. Grille in stock sizes up to 36 x 36". Nylon gives heat resistance over 300 F and provides smooth, non-pitting surface for ideal air flow with no condensation. Grille has slide-in principle that permits any model to be changed from horizontal to vertical.

circle 166 on reader service card

Room airconditioner

Product: Room airconditioner for high temperature areas (Model 150 A 3R5).

Manufacturer: Amana Refrigeration, Inc., Amana, Iowa.

Features: For areas where temperatures up to 125 F, has voltage fluctuations within 10% of rated 230 v. Has 4-way rust protection with zinc-coated steel given zinc phosphate treatment and 2-layer baked enamel finish of an epoxy resin, a silent blower wheel, 7-position automatic thermostatic control, and permanent polyurethane air filter. For use where extreme temperatures cause overheating and frequent automatic shut-off.

circle 167 on reader service card

Centrifugal pump

Product: End suction centrifugal pump (Type BHO, Series 300) for temperatures to 250 F.

Manufacturer: C. H. Wheeler Mfg. Co., Philadelphia, Pa.

Features: In 14 sizes from 1 to 5", will pump liquids in temperatures from sub-zero to 350 F at pressures up to 250 lb. Can be close-coupled using standard motors with NEMA shaft extensions. Supplied with packing or with internal or external mechanical shaft seals. Five 3/4" rings of packing and seal cage for stuffing boxes. Shaft deflection at face of box less than 0.002" at maximum radial thrust. Split 2-bolt glands

Continued on page 84



Testing set deluxe-

Instrument beauty! Not just outward beauty. Beauty that runs deep. The beauty of quality and precision...all the way through.

Polished brass cases with sparkling bevelled glass crystals held in knurled threaded rings that give ready access to the "Recalibrator"...so vital in a testing instrument. Two scales in color marked in corresponding temperatures of R-12 and -22. Precision movements that deliver the remarkable accuracy of plus or minus 1% of dial reading.

Compound gauge now has longer (0-80 lbs.) retard scale—and increased maximum reading...to 250 lbs. Range of pressure gauge also increased...to 400 lbs.

So much more for so little more! Own them proudly. Use them proudly. To fully appreciate them, see them.

—at your wholesaler

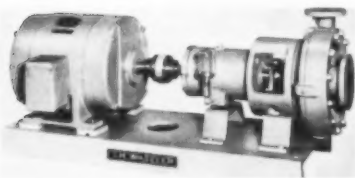
MARSH INSTRUMENT COMPANY, Dept. P, Skokie, Ill. Division of Colorado Oil and Gas Corporation • Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103 St., Edmonton, Alberta • Houston Branch Plant, 1121 Rothwell St., Sect. 15, Houston, Texas • Eastern Seaboard Warehouse: Marsh Instrument Company, 1209 Anderson Ave., Fort Lee, N.J.

MARSH Refrigeration Instruments

circle 37 on reader service card

Product DATA

Continued from page 83



standard, 4-bolt glands with quenching optional. Oil-lubricated bearings mounted in cast-iron housing with big oil reservoir. Small frames equipped with 4-bolt foot and large frame has support near coupling and near volute. Will handle clear or suspended process liquids.

circle 168 on reader service card

Ice flaker

Product: "Kwik-Flaker" ice flaker.
Manufacturer: Kold-Draft Div., Uniflow Mfg. Co., Erie, Pa.
Features: Provides ice reserve for peak load periods. Has sloping front; rounded

corners; recessed steel base; grey baked vinyl enamel finish; stainless steel lid, trim, and bin. Models are — 250 lb. with 200-lb. self-contained bin; 250 lb. remote flaker for new or existing bin; 300 lb. for use with remote flaker with opening on right or left or both sides. Has rugged gear head drive, detachable float chamber, forced draft ventilation, hermetically sealed refrigeration system.

circle 169 on reader service card

Upright freezer

Product: Upright, narrow freezer (Model 41XH) and refrigerator (Model R41).

Manufacturer: Nor-Lake, Inc., Hudson, Wis.

Features: Are 53½" wide and have 41 cu.ft. capacity and mullion cooling coils. Hermetically sealed compressors of ½ and

Here's where to find
the refrigerator door
gasket you need

Use Jarrow Door Gaskets for . . .

- COLD STORAGE DOORS
- WALK-IN FREEZERS
- COMMERCIAL REFRIGERATORS
- TRUCK BODIES
- ALL APPLICATIONS WHERE A DOOR GASKET IS REQUIRED

You'll want to keep this Jarrow catalog handy for quick reference on every gasket problem. And Jarrow's over a third of a century of gasket experience is your assurance of the most advanced engineering knowledge . . . finest quality products. Fast service from your local Jarrow wholesaler's stock. Write for your own copy of Catalog C-301a.

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1240 W. Fullerton Ave. • Chicago 14, Illinois

circle 28 on reader service card



¾ hp in refrigerator and freezer, respectively. Adjustable wire shelves and bun pan racks available for either or both sides of units. Exterior of baked white enamel though stainless steel optional; interiors of stuccoed aluminum with 3½" glass fiber insulation.

circle 170 on reader service card

Hot water boiler

Product: "RGWA Fac-Pak" hot water gas-fired boiler.

Manufacturer: Roberts-Gordon Appliance Corp., Buffalo, N.Y.

Features: Measures 12 x 26" and up to 35" deep. In high gloss baked enamel finish and capacities range from 50,000 to 90,000 Btuh. Includes cast iron boiler sections, insulated extended front jacket, circulator, wiring harness, controls, room thermostat. For areas where space at premium and low cost major consideration.

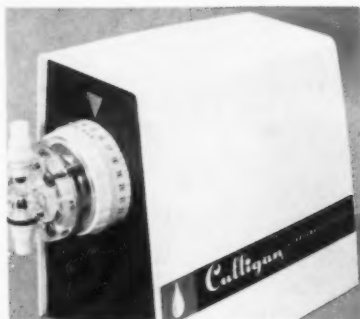
circle 171 on reader service card

Water treatment systems

Product: Automatic feeder and "Cul-Clear" water treatment systems.

Manufacturer: Culligan, Inc., Northbrook, Ill.

Features: Feeder will feed polyphosphates in any system where heated hard water forms scale, including water heaters, heat exchangers, evaporative condensers, cooling towers. Polyphosphates, silicates, alkaline substances and chlorine



compounds can be added to control corrosion, "red water", organic growths, and to neutralize acid water. "Cul-Cleer" systems is automatic feeder followed by filter and removes iron, manganese, hydrogen sulfide and clears turbid water by feeding coagulant.

circle 172 on reader service card

2-way transistor radio

Product: Truck-mount 2-way transistor radio with dashboard control head.

Manufacturer: Communication Products Dept., General Electric Co., Lynchburg, Va.

Features: Control unit 2½ x 2½ x 4½" and control head has 3-position (off-standby-on) switch. When on standby, radio ready to receive call and uses only 0.040 amps, permits driver to turn engine

ELIMINATE

algae, fungi, slime
with **anco**
DRY ALGAECIDE

Kill green growth and slime in cooling systems with this safe, sure, dry ANCO product. No need for shut-down or manual cleaning. ANCO gives you the most inexpensive, effective way to keep algae and slime out of water lines. Keep cooling systems clean at peak performance with ANCO.



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Buy ANCO for sure profits
Condenser Cleaner—Water
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THE REFRIGERATION & AIRCONDITIONING BUSINESS/AUGUST 1961

off and to leave radio operative. Extruded aluminum in control head and high-impact plastic in microphone. Available in high and low band frequencies, 25 to 54 mc and 130 to 174 mc. Power output to 100 watts available, depending on licensed frequency.

circle 173 on reader service card

Vaneaxial blower

Product: A 60" dia. belt-drive vane-axial blower.

Manufacturer: Hartzell Propeller Fan Co., Piqua, Ohio.

Features: Will move 96,450 cfm at 2" static pressure (98.3 BHP) or 66,500 cfm at 7" static pressure (116.7 BHP).

Has precision finished cast aluminum alloy impellers and all-welded construction with guide vanes welded to both inner and outer shells.

circle 174 on reader service card

Heat pump sections

Product: Indoor and outdoor 15-ton heat pump sections.

Manufacturer: Carrier Air Conditioning Co. Div., Carrier Corp., Syracuse, N.Y.

Features: Outdoor section (shown) is only 20½" high and has adjustable legs to heights of 12 or 18". Three vertical discharge propeller fans move 13,000

Continued on page 86

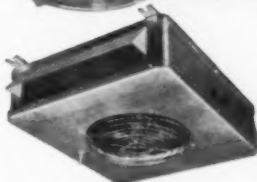


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Defrostair COILS
7 MODELS
Capacities 13850 to 44100
B.T.U./HR./10°F.T.D.

**AN ENGINEERING
ACHIEVEMENT...**
IN SIMPLICITY. EFFICIENCY. LOW COST



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Capacities 3800 to 12100
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Defrostair COILS
3 MODELS
Capacities 1800 to 3020
B.T.U./HR./10°F.T.D.



WITT
Defrostair COILS
3 MODELS
Capacities 1400 to 2200
B.T.U./HR./10°F.T.D.

Here's the ultimate in flexibility... 4 different shapes... 21 different models. The most complete line of low temperature coils ever offered for temperatures below freezing. Witt Defrostair exclusive patented Heat Trap features means low initial and installation cost. Designed to meet every demand for perfect performance. Requires only a low cost single pole, double throw time clock for complete automatic defrosting. There is a Defrostair electric defrost system to meet all your requirements. Write today for full particulars.

A. H. WITT COMPANY, INC. 940 N. Sycamore Ave.,
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**LOW
TEMP**
Defrostair

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**Automatic
Electric
Defrost
System**

* PATENT NO.
2539813-2492970

UNDERWRITERS
LABORATORIES
APPROVED



Product DATA

Continued from page 85

cfm at low sound level. Produces 173,000 Btu cooling at 95 F outdoor and 67 F wb indoor; produces 162,000 Btu heating at 40 F outdoor and 70 F indoor. Up to three 19.1 kw accessory electric heaters can be mounted on fan deck. Defrost cycle occurs every hour. Condensing pressure control optional and



compressor equipped with crankcase heater. Indoor section with or without ductwork and has matching plenum for free air discharge. Is 80" x 63 1/2" x 29 1/2" without plenum and with fan section on top; is 80 x 46 x 52" with fan section on back. Cabinet can be mounted vertically or horizontally, from ceiling, or on floor.

circle 175 on reader service card

Auto writing desk

Product: Auto writing desk for servicemen, salesmen.

Manufacturer: Mishek Supply Co., Waseca, Minn.

Features: Will fit all autos and trucks and no tools necessary to adjust horizontally or vertically to suit writing hab-



its. Writing surface is 12 x 20" and in masonite or plastic. Clip for papers or book optional. To install — hang over back of front seat, adjust thumb screws to drivers comfort. When not in use in auto, folds to 2 x 12".

circle 176 on reader service card

Temperature recorder

Product: Device that measures low temperature differences.

Manufacturer: Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.

Features: Utilizes "HO PowrLog" recorder for amplifying and recording and

eliminates need for pre-amplifier when measuring low temperature differences as hot water boilers, Btu output or air-conditioning system's Btu removal. One standard assembly adjustable for temperature difference range of 15 to 25 F; second for range of 50 to 200 F. Will also measure and control humidity by measuring wb and db temperature differences, measure temperature rise across pump, and measure air heater efficiency.

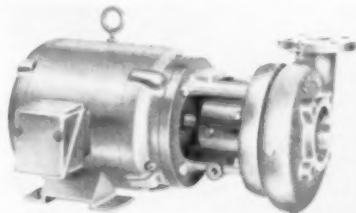
circle 177 on reader service card

End suction pump

Product: Type GBH close-coupled end suction pump.

Manufacturer: Aurora Pump Div., New York Air Brake Co., Aurora, Ill.

Features: Capacities range to 1600 gpm and heads to 330'. Optional water jacketed inserts provide accommodation of hot liquids up to 250 F and balanced cast impellers keyed and locked in position. Shaft sleeve construction, with "O" ring seal, provides positive sealing and extends seal or packing life. Balancing rings on sizes with 2" and larger discharge reduce thrust load on bearings.



Optional impeller rings extend impeller's life. Operating condition conversion possible with interchangeable mechanical seal or packing inserts.

circle 178 on reader service card

Refrigerant measuring tube

Product: Steel refrigerant measuring charging tube.

Manufacturer: Airserco Mfg. Co., Pittsburgh, Pa.

Features: Ranges in capacity from 5 to 100 lb. and has high pressure sight gage with automatic check valve. Gage glass enclosed in rotary circular plastic guard in which one, two, or three refrigerant scales mounted. No. 5250 refrigerant measuring tube calibrator supplied with each tube. Calibrator compensates scale reading for temperatures from 60 to 130 F.

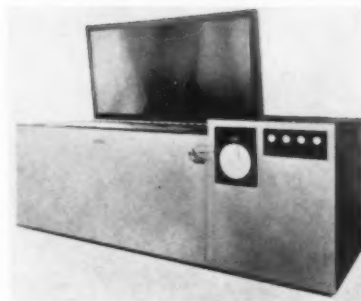
circle 179 on reader service card

Low temperature chamber

Product: Low temperature environmental chamber (Model WT-8-250).

Manufacturer: Webber Mfg. Co., Inc., Indianapolis, Ind.

Features: For work in research, processing, production with mechanically-refrigerated closed system able to reach -250 F. Will increase life of processing dies, tools, drills, broaches. Also for component testing, blood storage, instrument calibration, gas dehydration, gas lique-



faction, metal hardening. System can be incorporated in standard or custom chambers.

circle 180 on reader service card

Hydronic zone valve

Product: Motor operated hydronic zone valve (Model VM-120).

Manufacturer: General Controls Co., Glendale, Calif.

Features: Has synthetic packing to protect against leakage and 24-v. electric motor that needs no lubrication. Also has opening and closing speed of 30 sec. each cycle; brass body and trim; standard manual operator position indicator; maximum water temperature of 250 F. Body rating is 50 psi maximum and highest operating pressure differential 15 psi. Electrical specs are 2- or 3-wire, 2-position; non-current failure; 48 VA auxiliary switch with rating of 8 amps at 120-v. ac.

circle 181 on reader service card

Residential humidifier

Product: Residential humidifier for winter humidity control in forced-air installations (Model HR-2A).

Manufacturer: Air Conditioning Div., Westinghouse Electric Corp., Staunton, Va.

Features: Has a 0.2 gph atomizing capacity and can be installed in return duct of any system. Operates on 115 v., 60 cycle single-phase power and centrifugal atomizer is only moving part. When installed with a humidistat, maintains humidity between 30 and 50%.

circle 182 on reader service card

Duct insulation

Product: "E-Z Ply" spun mineral fiber duct insulation.

Manufacturer: Baldwin-Ehret-Hill, Inc., Trenton, N.J.

Features: Resin bonded insulation has breaking strength exceeding eight pounds for 1" thickness 6" wide. In either plain or with these factory-applied facings — black paper vapor barrier bonded with asphalt; scrim-reinforced aluminum foil laminated with flame-proof paper; embossed aluminum foil; neoprene. Facing corners of paper pre-folded for tight-butting adjacent panels. Has K factor of 0.24 at mean temperature of 75 F and maximum temperature limit of 450 F. Comes in 2 x 4' panels in thicknesses of 1, 1 1/2, 2".

circle 183 on reader service card

People

ON THE MOVE

Continued from page 57

Robertshaw-Fulton's Grayson Controls Div. appoints **John C. Lowe** product sales manager for its water-heater controls line. **David A. Bodine** becomes sales representative in Grayson's mid-western territory. He serves under **William H. Gilmore**, who succeeded Lowe as mid-western sales manager. **Hayden E. Roberts, Jr.**, is new sales representative for space and central heating controls in Grayson's southern territory. **William K. Rae** is transferred from the Indiana Div. to Grayson as sales representative for water-heater controls in the Chicago area.

Newton W. Mac Nichol joins Bell & Gossett Co. as special field representative for heating and cooling products in the company's eastern division. Mac Nichol was formerly with Warren Webster & Co. as general sales manager.

Daniel Chytalo joins Trane Co. as manager of owner-builder sales in the New York City office. New member of the company's Memphis, Tenn., sales office is **William P. Myers**.

Research Products Corp. appoints **Lloyd Ludkey** district salesman for northeast Ohio.

Pennsalt Chemicals Corp. appoints **Richard C. Willson, Jr.**, as technical service manager for "Isotron" products. **Allen B. Reed, Jr.**, is named supervisor of the Isotron aerosol laboratory. Both men joined Pennsalt in 1956.

Donald J. Jessup resigns as sales manager of the refrigeration department, Danville Div., Bohn Aluminum and Brass Corp. He is going into business as manufacturers agent and will continue to represent Bohn.

T. M. Broderick is named manager of motor sales for the Hunter Div., Robbins & Myers, Inc.

Norman F. Kelly is appointed assistant divisional sales manager of the New Bedford Div., Revere Copper and Brass Inc. Kelley joined the division in 1936.

Frederick G. Danning is appointed to the newly-created post of director of export sales at Pyramid Instrument Corp.

Kevan A. Durrell is named Canadian sales representative by Mueller Climatrol, Div. of Worthington Corp. He will maintain offices in Toronto.

Nicholas Klemm, Jr., is named product manager, school equipment, of Warren Webster & Co., Inc. Klemm has been with the company eleven years.

Continued on page 88



NOW!

**A SAFE
NEW
LIQUID
SCALE
REMOVER**

A safe, high density, super concentrated, non-toxic acid formulation. Contains no hydrochloric or other fuming acids and can be safely used on aluminum, brass, copper or steel. No neutralizer needed. Safe to drain on shrubs or plant life when properly diluted. Quickly removes hard water scale, algae, organic and inorganic materials. Goes to work immediately . . . saves time . . . Economical. Combines the advantages of both dry and liquid cleaners. One gallon dissolves about 5 lbs. calcium carbonate scale, or 1½ times more scale per gallon than hydrochloric or muriatic acid cleaners.

Super Concentrate is a general purpose, heavy duty, scale remover in unbreakable plastic jugs.

ASK YOUR DEALER FOR VAPCO SUPER CONCENTRATE and other fine Vapco products TODAY!

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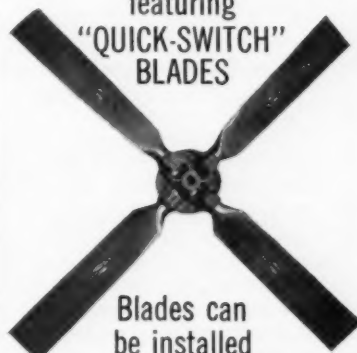
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Aeromaster
INDUSTRIAL COOLING

FAN

featuring
"QUICK-SWITCH"
BLADES



Blades can
be installed
after hub is mounted
on drive shaft

Performance, construction, and price make this the "best buy" in industrial fans! Delivers more CFM with less H.P. Features a ductile iron hub, removable blade retention caps, heat treated aluminum alloy blades with constant chord width and flanged ends. 4, 6 and 8 bladed fans available in 54" to 120" diameters. Maximum tip speed is 15,000 ft./min. Easy to install . . . easy to maintain. For complete details, write: KOPPERS COMPANY, INC., 5008 Scott Street, Baltimore 3, Md.



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TIME CLOCK for Trucks

Automatic! Tamperproof!

- Records every stop . . .
and how long!
- Shows when trucks are
traveling . . . and how long!

You can save hundreds of dollars every year by attaching a Servis Recorder to a truck.

Here's what one customer says: "Average annual savings from reduced idle time, maintenance, bad scheduling, and overtime will amount to approximately \$800 per truck, per year for our 83 units!"

Servis Recorders record busy and idle time on easily read, permanent charts. With these charts you can find the reason for delays, and tighten up on lax schedules.

It's called:
"SERVIS RECORDER"

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10 WAYS TO GET MORE WORK FROM YOUR TRUCKS

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Cleveland 14, Ohio

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TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

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People ON THE MOVE

Continued from page 87

Turner Corp. appoints **Peter J. Garvey** as direct factory representative in southern California. He replaces Roy Ljungberg.

Francis L. O'Donnel joins Simpson Electric Co. as marketing manager.

G. Edward Thompson is appointed regional sales manager for architectural products division, Burgess-Manning Co.

Janitrol Heating and Air Conditioning Div., Midland-Ross Corp., appoints **William M. Myler, Jr.**, as director of engineering. **Lee J. Wilcox** is named manager, design engineering section. Myler joined

Janitrol in 1928. Wilcox, who has been chief staff engineer, joined the company in 1935.

Ernest E. Bull is named sales engineer for Robertshaw-Fulton's Fulton Sylphon Div.

Trane Co. appoints **Thomas E. Scott** manager of its new sales office in Poughkeepsie, N.Y. Scott has been a sales engineer in the firm's Albany office.

Lawrence E. Jennings, Jr., is promoted to manager-refrigeration, commercial department for Danville Div., Bohn Aluminum & Brass Corp. **W. A. Edwards** is named sales representative for the Georgia territory and parts of Florida.

Managers are named for three Trane Co. sales offices. **Donald L. Rohan** heads the South Bend, Ind., office; **John E. Kirwan** in Aurora, Ill.; and **Thomas E. Scott**, the new Poughkeepsie, N.Y., office. **Hal W. Butler** and **Francis M. McGarry** join Trane as sales engineers.

NEW! WABASH

Micro Dri DRYERS

Filled with Davison
Microtraps!
A MOLECULAR SIEVE



- Amazingly high capacity even at high temperatures.
- Huge screen areas for low pressure drop.
- All brass.
- 5 sizes to 15 tons.
- Small and compact.
- Complete with forged flare nuts.

Write for Complete information and prices

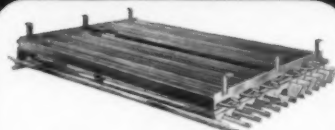
WABASH CORP.

2300 S. Western Ave., Chicago 8, Ill.
EXPORT DEPT.

13 E. 40th St., New York 16, N. Y.

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Buy Peerless FOR PERFORMANCE



Flash Coolers Fin Coils Flash Pans

The Peerless Line of quality products is designed and constructed to meet every demand of modern commercial refrigeration. Our Flash Coolers, Fin Coils and Flash Cooler Pans have proved their superiority in performance under widely varying operating conditions. They are built with an eye to appearance, economy of space, and the utmost convenience in installation and servicing. Louvers fabricated from polished aluminum. Made in a wide variety of standardized sizes and styles—all of unchallenged Peerless quality.

Write for Catalog 161

Peerless of America, Inc.

5800 N. Pulaski Road
Chicago 46, Illinois, U.S.A.

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AUGUST 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

BUSINESS *Briefs*

Continued from page 6

Gus Larson's wife dies

Mildred E. Larson, wife of Gustave A. Larson and mother of Karl Larson, of Gustave A. Larson Co., refrigeration and airconditioning wholesaler in Milwaukee, Wis., died June 21 in St. Joseph's Hospital, Milwaukee.

Larson is a charter member of Air-Conditioning and Refrigeration Wholesalers. His wife frequently accompanied him to association and industry meetings, so she had a wide acquaintance among refrigeration and airconditioning people.

Frick makes ice cans

Frick Co. has purchased the ice can business and production machinery from Ohio Galvanizing & Mfg. Co. Production of ice cans has started at Frick's Waynesboro, Pa., plant.

ARI updates standards in three product classes

Three new heat transfer standards have been published by Air-Conditioning and Refrigeration Institute, updating and consolidating a number of existing standards.

New standards are ARI-450-61, "Water-Cooled Refrigerant Condensers"; ARI-480-61, "Refrigerant-Cooled Liquid Coolers, Remote Type"; and ARI-495-61, "Refrigerant Liquid Receivers".

Ucon plans to distribute products in 43 countries

Ansul International Corp. of South America has been appointed international reseller for "Ucon" fluorinated refrigerants by Union Carbide International Co. These products will be distributed in 43 countries — Ucon 11, Ucon 12, Ucon 22, Ucon 113, and Ucon 114.

Ansul is making special arrangements with its overseas distributors for prompt return of cylinders and refund of deposits.



Sheldons to manufacture Canadian firm's products

Sheldons Mfg. Corp., Bensenville, Ill., has been formed recently to produce in the U.S. ventilating and airconditioning equipment designed by Sheldons Engineering, Ltd., Galt, Ontario.

William D. Sheldon, president of the Canadian company, will be chairman of the new firm. President of the American operation is George M. Egoft, Canadian vice president and managing director.

Electronic air cleaner available to consumers

Minneapolis-Honeywell's electronic air cleaner, already used by builders in complete home developments, is now being promoted at the consumer level. This product was introduced to wholesalers and

original equipment manufacturers early this year.

Direct mail pieces have already been sent to dealers throughout the country, according to K. L. Wilson, vice president of Minneapolis-Honeywell. Consumer promotion, headed by Dean Randall, advertising manager, will now establish themes having the greatest appeal to homeowners.

Embassy changes name

New name for Embassy Steel Products, Inc., is Embassy Industries, Inc. This change is the result of a diversification program started by the Brooklyn, N.Y., firm more than two years ago. It makes baseboard, steel boilers, and heating equipment.

No ice shortage here!

There's no running out for ice at the new Towers Hotel in Houston, Texas. Each room is equipped with an automatic supply of ice from a RCA "Icemagic" unit built right into the bathroom wall.

Phelps Dodge expands tubular products line

A complete selection of wrought and cast fittings has been added to Phelps Dodge Copper Products Corp.'s line of tubular products.

Both fittings are now available in sizes from 1/2 to 6". Low pressure valves will also be included in the new line.

Continued on page 90



READY TO ROLL are these four 15-ton tank trucks of Allied Chemical Corp.'s fleet that services the East Coast refrigeration industry from the Elizabeth, N.J., plant of the company's General Chemical Div. Enough refrigerant is being loaded into the trucks to charge 100,000 1-ton room units. In the background is the division's third plant, now nearing completion.

QUICK CLEAN

WITH
SURE KLEAN®

NUM 70 BER

ICE MACHINE CLEANER
AND STERILIZER



**REMOVES
SCALE
THOROUGHLY,
QUICKLY . . . &
STERILIZES
TOO!**

Actual photograph
of an auger taken
from Flaker Ice
Machine. The bottom
half was immersed
in SURE KLEAN Ice
Machine Cleaner
and Sterilizer . . .
and came out
bright and sterile!

**SURE • SAFE • EASY
ECONOMICAL**

As every serviceman knows, the biggest bogey with ice machines is scale. But at last, there is SURE KLEAN No. 70, a cleaner which sterile cleans . . . easily, safely, economically! SURE KLEAN No. 70 leaves no toxic residue, completely removes all germs, odors, contamination of any kind, and may be used as often as necessary without damaging equipment. And SURE KLEAN No. 70's harmless red dye, known as the Red Safety Factor, completely eliminates all guesswork in timing the job. When all pink traces are removed and the ice is firm and crystal clear . . . the solution has completed the job and the unit is sterile and ready for use.

SURE KLEAN No. 70
is the perfect cleaner for ALL
ice machines . . . either cube,
continuous flow or crushed ice
makers. Try it on your next ice
machine job.



FREE! Bulletin 70
and other details.
Write Department 70

PSC

The Process Solvent Co., Inc.

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(2398)

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BUSINESS *Briefs*

continued from page 89

Moves to new warehouse

Bornquist, Inc., Chicago distributor of Bell & Gossett Co. heating and airconditioning equipment for 25 years, has moved to a new office and warehouse.

The new 10,500-sq.-ft. facility, on the city's west side, is at 7050 N. Lehigh Ave. With its new warehouse, Bornquist can now speed up delivery of equipment plus a sales force increased by 25%.

No refrigerator needed for new Armour foods

Armour & Co. will soon market "freeze-dried" foods for sportsmen, hikers, outdoor workers, picnickers, and exploring parties.

Beef stew, chicken stew, and chicken and rice dinners will make up the menu. These foods will require no refrigeration.

MERGERS

Stockholders of Republic-Transcon Industries, Inc. have approved purchase of assets of Mathes Co., Div. of Glen Alden Corp. The Mathes plant in Marble Falls, Texas, will be R-T's sixth facility.

Tuthill Pump Co. has purchased Ossian Engineering Co., Inc., Ft. Wayne, Ind. Ossian manufactures a line of hand and electric gasoline pumps.

SALES FIGURES

A 12% jump in sales has been reported for the first quarter by Westinghouse Electric Corp.'s air-conditioning division. Total dollar sales also represented a record high for any first quarter during the division's 7-year stay in Virginia. There was a 45% increase in the number of individual packaged products sold by the division during the first three months.

EXPANSIONS

Plans for adding 10,000-sq.-ft. of modern factory space to its Pasadena, Calif., facility has been announced by Holly-General Div., Siegler Corp.

A 2-story general office building in suburban Richmond, Va., is under construction by Robertshaw-Fulton Controls Co. It will house the firm's corporate headquarters. Completion: early summer of 1962.

ASSOCIATIONS

John Everetts, Jr., has been elected president of American Society of Heating, Refrigerating & Air-Conditioning Engineers, Inc. He is a consulting engineer from Philadelphia, Pa. Other recently-elected officers are John H. Fox, vice president of Honeywell Controls, Ltd., Toronto, Canada, first vice president; Frank H. Faust, manager of product planning, marketing research service, central air-conditioning division, General

MORE SERVICEMEN PREFER MADDEN



HP-41

**BEST BUY
FOR THE
MONEY**

**1 VALVE
PIERCES
4 TUBE**

SIZES!

3/16" | 1/4" | 5/16" | 3/8"

**DUO-TEST QUICK COUPLER
CHARGING LINES**

36" flexible line. Quick
Coupler elbow on one
end. Color coded in
sets.



Stocked by leading wholesalers everywhere

M
MADDEN BRASS

**MADDEN BRASS PRODUCTS
COMPANY**
AURORA 2, ILLINOIS, U.S.A.
EXPORT: AD AURIEMA, INC.
85 BROAD ST., New York, N. Y.

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Electric Co., second vice president; and John E. Dube, president, Alco Valve Co., treasurer.

Henry G. Strong has been named chairman of the newly-formed committee on state and municipal laws and regulations of **Air-Conditioning and Refrigeration Institute**. The new committee will take over, in part, activities carried out by Refrigeration Industry Safety Advisory Committee (RISAC) and, later, the Air-Conditioning and Refrigeration Industry Safety Committee (ARISC). Strong, a member of the ARI staff, has been executive secretary of both RISAC and ARISC.

Everett Elliott has been elected board chairman of the new **National Oil Fuel Institute** at the group's first meeting since the organization was approved in May. The board also okayed the constitution and by-laws and short-term programs recommended by Glenn L. Werly, president. First annual meeting of NOFI has been scheduled for October when a new board will be elected.

Glenn P. Bakken re-elected president of **Copper & Brass Research**

Association at its 39th annual meeting. He is president, Chase Brass & Copper Co., Inc. Re-elected senior vice president was E. P. Dunlaevy, executive vice president of Phelps Dodge Copper Products Corp. Newly named vice presidents were Richard L. Allen, Bridgeport Brass Co.; Bailey I. Ozer, Viking Copper Tube Co.; Paul W. Robson, Wolverine Tube, Div. of Calumet & Hecla, Inc.; and R. P. Winberg, Revere Copper & Brass Inc.

Rixford A. Beals has been named manager of **National Better Heating-Cooling Council's** commercial and industrial division. He was editorial director, American Institute of Mining, Metallurgical and Petroleum Engineers.

New chairman of the marketing research board for **Gas Appliance Manufacturers Association** is T. J. Williams. He is manager, marketing administrative services for Janitrol Heating and Air Conditioning, a Div. of Midland-Ross Corp.

Air Moving & Conditioning Association, Inc. has issued an official directory of products licensed to carry its certified performance rat-

ings seal. The directory is designed to assist users and specifiers of air moving devices and contains data on more than 5000 products.

NAMED TO REPRESENT

Chemicator, Inc., Div. of Erlen Products Co. — Flarapco, Inc., Miami, Tampa, Jacksonville, and Orlando, for parts of Florida.

General Blower Co., Sub. of Ilg Electric Ventilating Co. — Allen Mitchell & Co., Washington, D.C.

Heat-Controller, Inc. — Kramer and Associates, Inc., Dearborn, for Michigan; **A. J. Taylor**, Little Rock, for Arkansas, northern Louisiana, and western Tennessee; **Weldon Kite**, Denver, for Colorado; **Dean L. Hunzicker**, Madison, for Wisconsin; **Kennon & Johnson Co.**, Atlanta, for Georgia and northern Alabama.

Ilg Electric Ventilating Co. — George J. Burke, Narbertha, Pa.

Worthington Corp. — General Refrigeration Co., El Paso, for air conditioning and refrigeration products in parts of Texas and southern New Mexico.

CRS Industries, Inc. — Paller Engineering Co., Indianapolis, for central Indiana.

Day and Night Mfg. Co. — Robert Gillis Co., Charlotte, for North Carolina, South Carolina and Virginia; **Walter F. Morris Co.**, Boston, Mass.

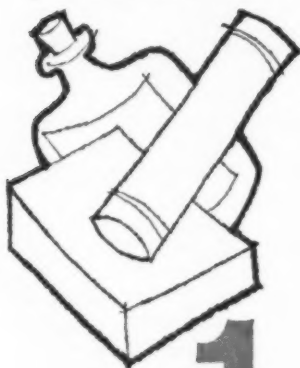
Burgess-Manning Co. — King & Co., New Orleans, for Louisiana and selected counties in Mississippi.

Westinghouse Electric Corp., Sturtevant Div. — Forney Fuller & Associates, New Orleans, for Louisiana, Mississippi, Texas, southern Arkansas, and western Tennessee.



RESEARCH RESULTS reported by National Warm Air Heating and Air Conditioning Association's research staff were analyzed recently by members of the Research Advisory Council. This research staff is located at the University of Illinois. Council discussed results during its 2-day semi-annual meeting in Cleveland, Ohio. Members seated (left to right) are: William H. Wentling, Lau Blower Co.; William M. Myler, Jr., Janitrol Heating & Air Conditioning Div., Midland-Ross Corp.; Wendell Maudlin, Stewart-Warner Corp., Heating & Air Conditioning Div.; R. N. Mehendra, York Div., Borg-Warner Corp.; Harold E. Straub, Titus Mfg. Co.; Norman A. Buckley, Iron Fireman Mfg. Co.; Dr. Stanley Gilman, Carrier Corp.; and Graydon Peoples, Lennox Industries, Inc.

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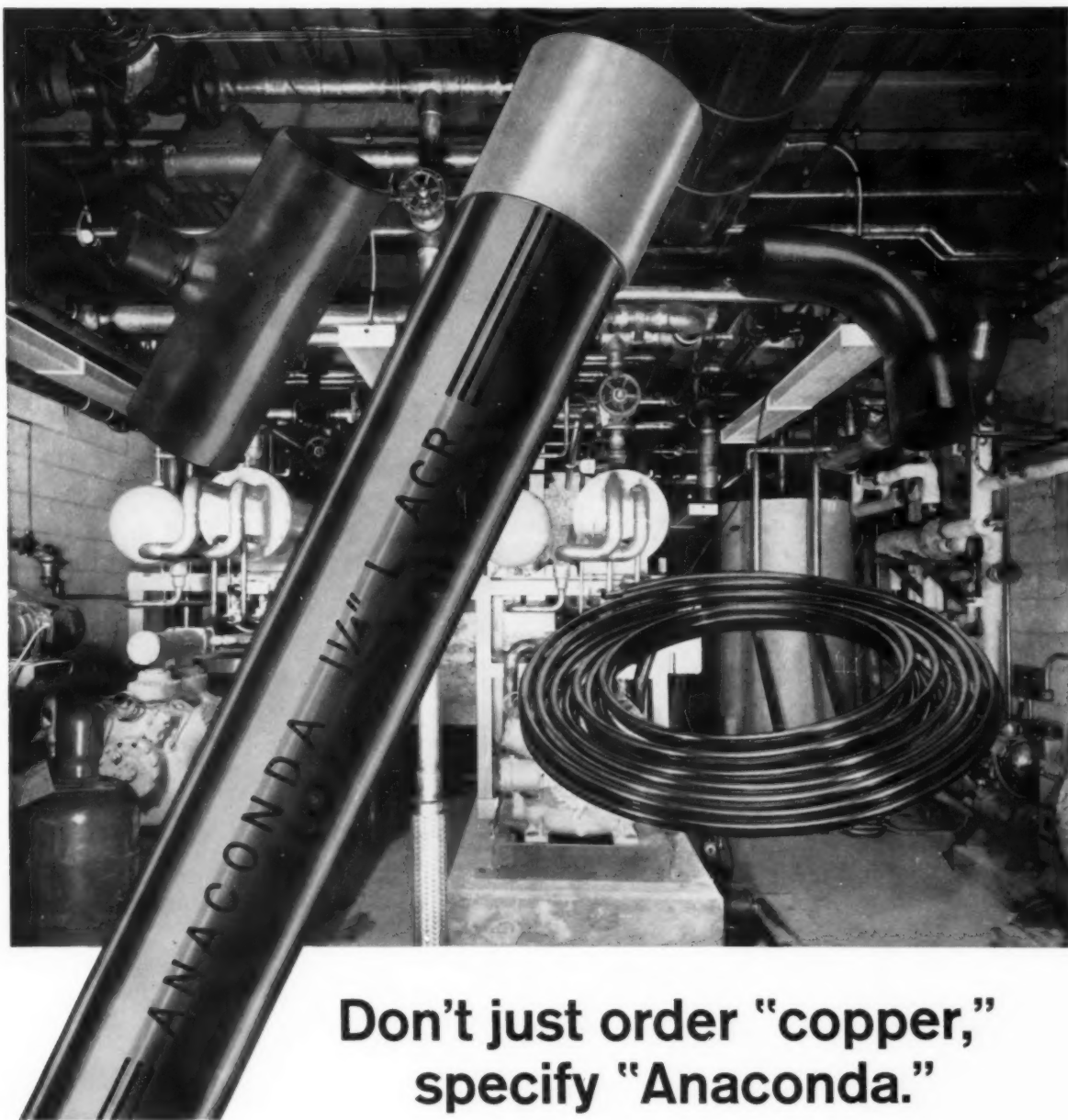
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Acme Electric Corp.	74	Madden Brass Products Co.	90
Aerovox Corp.	72	Marsh Instrument Co., Div. of Colorado Oil & Gas Corp.	83
Airserco Mfg. Co.	80	McIntire Co.	36
Alco Valve Co.	1	McQuay, Inc.	47
Allied Chemical Corp., General Chemical Div.	14-15	Minneapolis-Honeywell Regulator Co. (Zone B copies only)	22-23
American Automatic Ice Machine Co.	7	Mortell Co.	62
Amprobe, Div. of Pyramid Instrument Corp.	17-18	Mueller Brass Co.	25
Anaconda American Brass Co.	Cover 3		
Anderson Chemical Co., Inc.	85	N	
Ansul Chemical Co.	61	National Copper & Smelting Co. (Zone A copies only)	11
Armstrong Cork Co.	69	Nibco Inc.	9
		Nor-Lake, Inc.	59
B		P	
Bacharach Industrial Instrument Co.	60	Paragon Electric Co.	4
Bell & Gossett Co.	33	Peerless of America, Inc.	88
Bendix-Westinghouse, Evansville Div.	30	Penn Controls, Inc.	8
C		Phelps Dodge Copper Products Corp.	5
Chemical Solvent Co.	92	Process Solvent Co., Inc.	90
Coldin Cabinet Co., Inc.	80		
D		R	
Dow Chemical Co.	56, 57	RBM Controls Division	21
Dunham-Bush, Inc.	27	Ranco Inc.	64
E		Refrigeration Appliances, Inc.	55
E. I. du Pont de Nemours & Co., Inc., Industrial & Biochemicals Dept.	73	Reznor Mfg. Co.	71
Ellison Draft Gage Co., Inc.	82	Robinair Mfg. Corp.	10
Erlen Products Co., Chemicator Div.	75		
G		S	
Garman Co.	87	Service Recorder Co.	88
General Electric Co., Instrument Dept.	35	Sporlan Valve Co.	31
H		Stiles-Karlsonite Corp.	70
Halstead & Mitchell Co.	24		
Hubbell Corp.	78	T	
I-J		Tenney Engineering, Inc.	12
Industrial & Biochemicals Dept., E. I. du Pont de Nemours & Co., Inc.	73	Texas Instruments Inc., Metals & Controls Div.	60
International Heater Co.	79	U	
Jarrow Products, Inc.	84	Uniflow Mfg. Co.	63
K		Union Carbide Chemicals Co., Div. of Union Carbide Corp.	2
Kenmore Machine Products, Inc.	13		
Kerotest Mfg. Co.	76	V	
King Zeero Co.	82	Viking Copper Tube Co.	Cover 2
Koppers Co., Inc.	20, 87	Virginia Chemicals & Smelting Co.	51-52
Kramer Trenton Co.	77	Volkswagen of America, Inc.	26
L		W	
La Crosse Cooler Co.	70	Wabash Corp.	88
Larkin Coils, Inc.	29	Wagner Electric Corp.	32
		Watsco, Inc.	81
		A. H. Witt Co., Inc.	85
		Worth Chemical Products Co.	19
		Wright-Temp Mfg. Co. (Zone B copies only)	11



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